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ABSTRACT

Assessing the property tax in terms of agriculture, this report analyzes the following in an historical sense in order to draw implications for the future: (1) the importance of the property tax to the agricultural sector; (2) the horizontal equity of the property tax for the agricultural and nonagricultural sectors in terms of income and wealth; and (3) some of the internal changes in the agricultural sector which have a bearing on the property taxes paid by that sector. Three key property tax series provide the core data for much of this analysis. Impetus for this study is explained in terms of secular change--relative decline of the agricultural sector; declining role of the property tax; growth of local nonproperty taxes; increased exemption of personal property; increased relief to homeowners; increased use of differential assessment; changes in educational finance. Presented via narrative and tabular data, the analysis deals with: property tax incidence (traditional view, current view, and implications); agricultural-nonagricultural comparisons (income and wealth basis); and internal agricultural sector changes (number of farms, taxable farmland, farm population, value of farmland and buildings, real estate as an input, and farm income). The analysis concludes that the longrun horizontal tax/income ratio inequity of the property tax borne by the agricultural sector is likely to continue. (JC)

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AGRICULTURE AND THE PROPERTY TAX

A Forward Look Based on a Historical Perspective

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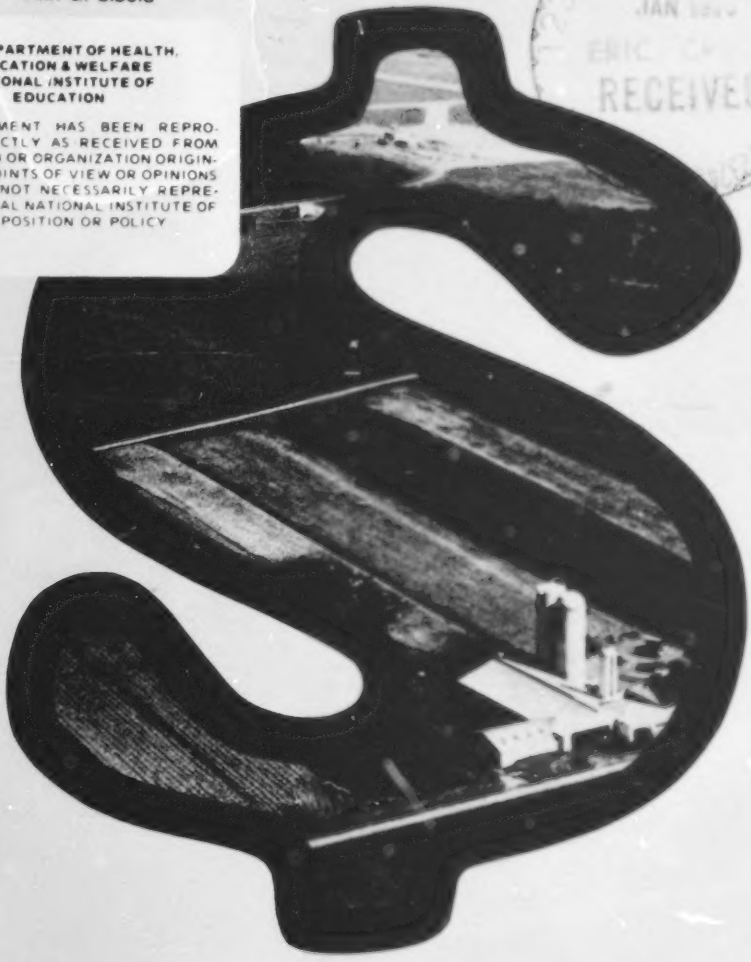

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ABSTRACT

An evaluation in a historical setting is made of: (1) the importance of the property tax to the agricultural sector, (2) the horizontal equity of the property tax for the agricultural sector in terms of both income and wealth, and (3) some of the internal changes in the agricultural sector which have a bearing on the property taxes paid by that sector. Horizontal equity of the farm property tax is investigated under various assumptions.

Keywords: Taxation, Property tax, Farm real estate tax, Farm personal property tax, Agricultural taxation.

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SUMMARY

The purpose of the report is to analyze the following in a historical sense in order to draw implications for the future: (1) the importance of the property tax to the agricultural sector, (2) the horizontal equity of the property tax for the agricultural and nonagricultural sectors in terms of income and wealth, and (3) some of the internal changes in the agricultural sector which have a bearing on the property taxes paid by that sector.

One way of measuring tax neutrality among industries is to compare taxes with the share of national income originating from the industries in question. During the 1932-75 period, farm property taxes accounted for 8.0 percent of all property taxes, but only 4.0 percent of the national income originating in farming. (Data are available for all series only since 1932.) Viewed another way, during the same span property taxes took 7.9 percent of the national income originating in farming, but only 4.0 percent of the national income originating in the nonfarm sector. By these measures, the agricultural sector has been paying proportionately more of the Nation's property tax bill than has the nonagricultural sector, when this burden is compared with the two sectors' respective shares of national income. The report enumerates a number of hypotheses that may be advanced to explain the disproportionate burden of the agricultural sector.

The situation regarding agriculture's share of national wealth and its share of the total property tax bill is not quite as clear cut. A measurement of horizontal equity between sectors by the ratio of taxes to wealth shows that the agricultural sector traditionally has paid proportionately fewer property taxes than has the nonagricultural sector. Data show that this conclusion holds for the entire post-1935 time period. In 1935, the ratio of property taxes to wealth was .010 (1.0 percent) for the agricultural sector and .015 (1.5 percent) for the nonagricultural sector. In 1974, the ratios were .006 and .014, respectively. Throughout the 30-year span, the range of ratio differences in favor of the agricultural sector varied from .002 to .007. However, the evidence suggests that property taxes are capitalized into farm property values. This depresses the farm values to some degree and distorts comparisons with other sectors. Of course, there are varying degrees of property tax capitalization in the other sectors as well.

Nevertheless, taxes are typically paid from current income. So the policymaker's concern about the relative tax/income ratios tends to dominate that for the relative tax/wealth ratios—and the concern for the agricultural sector's comparative "burden" continues.

The burden of the property tax also should not be viewed in a vacuum—property taxes comprise only one segment of the total U.S. tax system. Other taxes may favor the agricultural sector. Local property taxes are deductible

from Federal income taxes. Thus, high property tax bills may result in lower income tax bills and a much different tax burden overall. The most recent evidence indicates that the burden of the U.S. tax system by level of family income is approximately proportional.

The farm property tax provides longrun stability as a source of revenue. This is because of the constancy of farmland as an input in the agricultural sector (18-20 percent of all farm inputs since 1870) and because the value of farmland and buildings as a percentage of the value of all farm assets has not changed much though time. The basic historical factors that influence farm property taxes do not appear likely to vary much in the foreseeable future. Thus, the longrun horizontal tax/income ratio inequity of the property tax borne by the agricultural sector is likely to continue.

AGRICULTURE AND THE PROPERTY TAX: A FORWARD LOOK BASED ON A HISTORICAL PERSPECTIVE

Jerome M. Stam and Ann Gordon Sibold[1]

INTRODUCTION

Property taxation is one of the oldest means of raising public revenue, particularly at the local level. The nature and scope of this tax have varied much through the years, especially with regard to types of property actually subject to taxation.

This report, using a historical setting, evaluates (1) the importance of the property tax to the agricultural sector, (2) the horizontal equity of the property tax for the agricultural sector (vis-a-vis the nonagricultural sector) in terms of both income and wealth,[2] and (3) some of the internal changes of the agricultural sector which have a bearing on the property taxes paid by that sector. Horizontal equity of the farm property tax is investigated under various assumptions.

In colonial times, specific property tax rates often were applied to particular categories of property, and types of property specifically not included by legislative enactment in the taxable list were exempt (*31*, pp. 10-12).[3] However, property taxes were not a large part of colonial revenue structures. Poll taxes, customs and excises, and primitive forms of income taxation generally were more important. Through time, other items have been added to the taxable list in the United States, as governments have sought to raise more revenue or to tax most property similarly.

This evolutionary development resulted in the general property tax as it

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[2] The principle of horizontal equity states that equals should be treated equally. In U.S. law, this principle is reflected in the legal rule of equality under the law. In tax theory, it is reflected in the ability-to-pay criterion, which states, first, that individuals ought to be taxed according to their ability to pay, and second, that individuals having similar economic circumstances should be taxed equally. In this report, horizontal equity is first measured in terms of taxes as a percentage of income. But income is not the only criterion of ability to pay. The property tax is a type of wealth taxation and another measure of horizontal equity between sectors is tax payments as a ratio or percentage of wealth. (This assumes that wealth is correlated with holdings of taxable property.) This is the second horizontal equity concept addressed in this report.

[3] Italicized numbers in parentheses refer to items in literature cited, p. 61.

existed beginning shortly before the Civil War (*26*, pp. 26-47). The principle of taxing according to market value had become established and the base of the tax had been broadened. The intent was the taxation of all property, movable and immovable, tangible and intangible, real and personal at one uniform rate. This approach resulted from the presumed equity of the tax, distrust of the earlier legislative exemption policy, and aversion to possible preferential treatment of some forms of property.

The feeling in mid-19th century America was that property ownership was an adequate indicator of taxpaying capacity and that the burden of taxation could be distributed equitably on the basis of property values regardless of form or use. Thus, this assumption of homogeneity was at the center of general property tax theory. This was reasonably valid in a largely agricultural economy without great variations in the distribution of wealth and income. The general property tax was therefore a reaction to the selective property tax system which preceded it and but one stage in property tax evolution.

The subsequent development of a more specialized economy put pressure on the general property tax homogeneity assumption. Property holdings became more complex over time as did the actual property tax code. Economic reality came to differ from the older basic assumptions about the property tax and this led once again to challenges to the system. The property tax became the most widely attacked part of our tax structure. This criticism has been expressed for at least a half century (*30*, p. 99).

Despite the mounting criticism, the property tax still has a number of advantages. Among those advantages: (1) it has a relatively stable yield; (2) it is the largest source of locally generated tax revenue and it cannot be easily replaced by other forms of taxation; (3) it permits a great degree of local administrative discretion and local control; (4) it provides for appropriate taxing of private property that is enhanced by local public services; (5) it falls more heavily on the wealthy (with large property holdings) as it perhaps should; and (6) it encourages owners of marginal or nonproductive properties to develop or sell them engendering a higher social use for the property.[4]

In the modern setting, however, the list of alleged problems with the property tax remains quite long. Among the alleged disadvantages frequently noted are: (1) regressivity (absorbing a greater proportion of the income of low-income than high-income families), (2) a relatively inflexible yield, (3) an increasing list of exemptions which may increase inequities, (4) administrative difficulties, (5) encouragement of urban blight because of its tendency to discourage improvements, and (6) possible creation of tax competition between adjacent taxing districts because of potential impact on residential and business location decisions.

A view of property taxation from a historical perspective shows that it grew out of a basically agrarian setting and, despite efforts over time, it is not

[4] Item (6) is true only if land is assessed at its highest and best use. If land is assessed at a current use that represents less than highest and best use, an increase in the property tax simply yields a capital loss to the owner.

yet adjusted to an essentially urban society. The early property tax was more equitable than is presently the case because most wealth was held in the form of property, land was fixed in location, and services demand were few. Today, only a small share of national wealth is represented by real estate. Many Americans own no real property, but have relatively large sums invested in intangibles. Such wealth is highly mobile, making it difficult for local governments to tax. Also, local service demands have grown, thus increasing the pressure on the property tax base.

The relationship of the property tax to American agriculture through the years has been the topic of numerous economic studies. Most of these studies have focused on specific problems in a relatively short time frame. It is interesting to view the property tax and agriculture in the United States in a broader historical context; for example, since colonial times. Unfortunately, the data are limited largely to the 20th century. This is not as restrictive as it may seem at first glance, however, since it has been during the last three-quarters of this century that the developments concerning the property tax have accelerated. As short as this period is, it has seen the U.S. economy and its tax system evolve from domination by rural institutions to domination by cities, by wealth held in intangible forms, and by a population largely remote from land.

REASONS FOR STUDY

There are two major reasons for this study. The first is to assess the potential effect of secular change on the property tax, and the second is to examine new theoretical developments.

SECULAR CHANGE

A number of factors have the potential to alter the relative property tax burden of the agricultural sector vis-a-vis the nonagricultural sector.[3] Some of these have become more important in recent years. Some may be beneficial to the agricultural sector while others may be detrimental—but their overall, net effect is not clear on an a priori basis. Part of the intent of this study is to look at the net effect of these factors on the agricultural sector in a macro setting. Though it is not the purpose of the study to investigate each of the factors in detail, some brief comments on a few of the factors follow.

Relative Decline of the Agricultural Sector

The role of the agricultural sector in the U.S. economy has changed drastically in this century. The gross national product (GNP) in current dollars

[3] This is a question of horizontal equity between the sectors. Horizontal equity is one of the most widely accepted criteria for the distribution of taxes among individuals under the ability-to-pay principle. It states that individuals in similar situations should be treated similarly, or more precisely, people with equal incomes or wealth should be treated equally.

increased 62 times between 1902 and 1975. The relative share of the GNP accounted for by the farm sector declined from 9.3 percent to 3.3 percent between 1929 and 1975, despite a 4.2-fold growth in gross farm product during the same period (*55, 69*). Thus, one important question is whether, other things being equal, the property tax load of the agricultural sector has declined proportionately with its declining share of national income and wealth.

Declining Role of the Property Tax

There have been great changes in the role the property tax plays in the U.S. tax system. Property taxes accounted for only 15.5 percent of all governmental (Federal, State, and local) tax revenues in 1974/75, compared with 51.4 percent in 1902 (*55, 58*). The big change occurred at the State level where property taxes account for only 1.8 percent of all tax revenues today (1974/75), compared with 52.6 percent in 1902. At the local level, property taxes declined from 73.1 percent to 34.2 percent of total general revenues (local general revenues and intergovernmental transfers) between 1902 and 1974/75. Despite this transition, property taxes still accounted for 81.6 percent of local governmental tax revenue in 1974/75, compared with 88.6 percent in 1902. These changes reflect movements to income taxes at the Federal level; to sales, excise, and income taxes at the State level; and to more intergovernmental transfers to local units.[6]

The important question is how the agricultural sector fared under these changes in a comparative sense, especially in view of its relatively high-capital and low-income characteristics and the switch to more income and sales types of taxation throughout the country. If the property tax is truly regressive, less reliance on it should disproportionately benefit the agricultural sector.

Growth of Local Nonproperty Taxes

There has been an increase in local nonproperty taxes through the years, especially in the urban areas (*14*). Local sales taxes began in New York City in the 1930's and by 1973 were authorized in 25 States and the District of Columbia (*3*, pp. 252-253). Local income taxes began in Philadelphia in the 1930's and were found in 10 States and the District of Columbia by 1973 (*3*, pp. 291-294). Both local sales and income taxes tend to be found in the larger, more densely populated local jurisdictions and are not common in the more rural areas. The net effect has been relatively less local reliance on the property tax in many of the more urban areas, which opt instead for local nonproperty

[6] This discussion focuses on the broad historical sweep of this century. However, Aaron notes that statistical indicators conflict on whether the property tax has become more or less important since 1950 (*2*, pp. 8-9). He observes that property taxes since that time rose slightly both as a percentage of GNP and as a percentage of all taxes. This occurred, because even though property taxes declined since 1950 as a percentage of State and local tax revenues, overall State and local taxes (and expenditures) grew more rapidly than Federal tax revenues or the GNP. Much of the local increase was caused by the growth of elementary and secondary education needs which are funded in large part locally via the property tax.

taxes and often higher levels of governmental services. This trend to local non-property taxes thus, in balance, may have caused the agricultural sector to bear an even larger share of the total property tax burden through time.

Increased Exemption of Personal Property

There has been a trend toward exempting personalty from taxation. This is part of the longrun property tax cycle that has been observed by a number of economists (*31*, p. 16). It has been observed that as economies develop, taxation moves from a specific to an ad valorem rate, and from taxation of land to taxation of most property.[7] Then, because property becomes more heterogeneous and ownership is distributed less equally, other taxes are substituted and the property tax reverts essentially to a levy on realty. The United States is now in the second phase of this cycle, and the exemption of personalty from taxation should have benefited the agricultural sector more than the non-agricultural sector. This is because items such as livestock, farm machinery, and motor vehicles were considered as personal property under many of the old property taxes laws. Such farm items are no longer considered as personal property in a majority of States (*48*).

Increased Relief to Homeowners

Measures have been enacted in recent years to provide property tax relief for homeowners, and aged and low-income families. This is based on the belief that the property tax is regressive. Homestead exemptions were adopted in a number of States beginning in the 1930's. This method granted relief to all owners, however, not just those with low incomes. And, it completely ignored renters. The State generally provides the relief by excluding a portion of the assessed value of a single-family home before applying the tax rate. According to Aaron, some 34 States had this type of relief in early 1974 (*2*, p. 72).

However, this approach has been losing ground to the circuit-breaker method pioneered by Wisconsin in 1964. This is an attempt to overcome the problems of the earlier plans by granting relief when the property tax bill (or tax equivalent for renters) exceeds a certain percentage of household income.

Some States grant circuit-breaker tax relief equal to a given percentage of the property tax bill, depending upon the household income level. Relief may come as a direct reduction in the property tax bill, a refundable credit against State income taxes, or a cash refund.

By the end of 1974, some 24 States and the District of Columbia had adopted some form of circuit-breaker law (*5*). Under a farm circuit-breaker law adopted by Michigan in 1974, farmers receive a refundable tax credit for property taxes in excess of 7 percent of household income.[8]

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[7] *Specific* refers to a fixed, flat rate tax imposed without regard to value on a certain type of item; *ad valorem* refers to a tax that varies with the value of the taxed item.

[8] Typically, States restrict relief for farmers to taxes on the dwelling and 1 acre of surrounding land. However, Wisconsin includes farms and other homesteads up to 80 acres of land (*5*, p. 17).

The homestead-exemption and circuit-breaker situation presents a mixed picture for the agricultural sector. Because this sector is more capital intensive, it would seem that this type of relief is relatively less significant to it than to the residential property owner who receives much of the benefits of this type of program in the nonagricultural sector. The reason is that homesteads comprise only a fraction of the total value of farmland and through time continued farm consolidations have resulted in fewer buildings in the agricultural sector. However, in terms of current income, the homestead and circuit-breaker provision may be quite important to farmers.

Increased Use of Differential Assessment

Another important development in the evolution of the U.S. property tax has been the passage, beginning with Maryland in 1956, of various types of differential assessment laws. Such laws calling for the assessment of farmland on the basis of its value in agricultural uses rather than other potential uses had been adopted in 31 States by 1974 (*23*). These commonly have been passed for one or two major reasons: (1) a belief that the normal property tax discriminates against farmers and (2) a desire to influence land use and encourage preservation of land for farming or other patterns of open space.

Differential assessment laws vary among States, making it increasingly difficult to classify them into a few broad types. The impact of differential assessment laws and practices varies greatly by State and locality. The differential assessment approach may sometimes be controversial. The impact should be a favorable one for the agricultural sector, but higher property taxes may be forced on the nonagricultural sector to raise the same amount of total revenues as previously.

Changes in Education Finance

There have been a number of recent developments in the field of educational finance affecting the property tax. Local schools accounted for 42.6 percent of all direct general expenditures by local governments in 1974/75, compared with 27.1 percent in 1902 (*55*, *58*). In 1972/73, 92.4 percent of locally raised school revenues still came via the property tax and, in recent years, over half of all local property taxes have gone to support local schools (*4*, pp. 18-19, *70*). Because of this important linkage between the property tax and education, many changes in the field of school finance greatly affect this tax.

Recently, many States have tried to reduce the dependence of local schools on the property tax. This trend was undoubtedly encouraged by court cases, such as the August 1971 *Serrano vs. Priest* decision under which the California Supreme Court ruled that the financing of the educational system through the local property tax violated the individual's right to equal protection under the law. Even though the U.S. Supreme Court largely negated this decision in March 1973 in the *Rodriguez vs. San Antonio Independent School*

District case, an atmosphere favorable to increased reliance on nonproperty taxes for school financing remains.

A number of States thus have moved to what is called the "cost equalized" approach for financing local schools. This is important because, when the "cost equalized" approach is combined with overall higher Statewide per pupil levels of educational spending, the wealthier districts with higher assessed valuations of property are now required to pay proportionately more to support local schools. The poorer districts pay comparatively less, with the difference provided by State aid from nonproperty tax sources. This is an important aid to the agricultural sector since most poorer school districts are located in rural areas and have been historically heavily supported by local property taxes.

THEORETICAL DEVELOPMENTS

In recent years, a number of economists have changed their way of viewing property tax incidence. In short, the traditional view has been that landowners bear the tax on land, but that the tax on buildings, improvements, and businesses is borne in large part by consumers in proportion to their consumption patterns. The property tax, thus, was an excise tax and was thought to be regressive because increases in income do not lead to proportionate increases in consumption.[9] The new view is that the property tax leads to a lower overall rate of return on investment with the tax ultimately being borne by the owners of capital (*2*). This leads to the conclusion that the tax may even be progressive because the ownership of capital is concentrated in the higher income brackets. The importance for the agricultural sector is that the degree of horizontal property tax equity it receives (vis-a-vis the nonagricultural sector) depends in part on the theoretical view held. This will be illustrated in detail below.

THE PROPERTY TAX DATA

Three key property tax series provide the core data for much of the analysis. These are the total property tax series of the Governments Division of the Bureau of the Census, and the USDA series on the farm real estate and farm personal property taxes.

The Census series reports taxes stemming from the ownership of property and measured by its value. This includes general property taxes relating to property as a whole, real and personal, tangible or intangible, whether taxed at a single rate or at classified rates, and taxes on selected types of property, such as motor vehicles or certain intangibles (*55, 58*). This series reports taxes actually collected.

The Governments Division's historical data series date back to 1902, but prior to 1944 the Division prepared data only for selected years. The early

[9] It is an excise tax on the non-land portion only. The incidence on land-site value considered separately may even be progressive (*2*, pp. 19-20).

years are benchmarks which were specially compiled from various historical sources. No similar compilation has been made for the unpublished years. For 1962 and earlier years, the amounts for the various governmental units were grouped in terms of fiscal years ending within the particular calendar year. Beginning in 1962/63, the data for State and local governments were grouped in terms of fiscal years which closed within the preceding 12 months ending June 30.[10]

The USDA tax series on farm real estate includes all ad valorem taxes levied on farmland and improvements that are imposed by State and local governments. Special assessments, presumably based on benefits received and not on value itself, are excluded. Taxes levied rather than taxes paid are shown, partly because of differences between the tax year and the calendar year. In general, tax levies are due in two or more installments. Usually, the first of these is due in the fall of a given year and the rest in the following year. If payments were used, an arbitrary allocation of the payments between the 2 years would be required.

Also, because of possible tax delinquency, payments for any given year may not indicate the taxes that should have been paid in that year. Real estate taxes, however, are a lien against the property. In most States, they must be paid by a certain date or the property becomes subject to a tax sale. Because of this, in the long run, taxes levied and taxes paid are about equal. In measuring relative changes from year to year, levies are deemed to be more reliable than payments.

Tax data are usually obtained from county or town officials, by means of mailed questionnaires. A questionnaire is sent to the tax official in each county (or town) or each State, except for a few predominately urban counties. The official is asked to select 5 to 20 farms (depending on the State) that are representative of the various sizes and types of farms found in the county or town. For each of these farms, he is asked to record the acreage and the total amount of real estate taxes levied for the current year and preceding year. Tax data are collected annually for more than 37,000 farms. These data are expanded into national estimates of the farm real estate tax for that year using a link-relative technique. Every 10 years, the data are benchmarked on the Survey of Agricultural Finance conducted by the Bureau of the Census. The farm real estate tax data series extends back to 1890.

The USDA farm personal property tax series shows total ad valorem taxes levied by State and local governments on the taxable personal property of farmers. The taxes included are those levied on farm machinery, livestock, and household furnishings. Motor vehicles on farms are also included when taxed under property tax laws. Both general and special taxes are included if levied annually on the basis of value, but special assessments are omitted. Taxes levied are used because data on taxes paid are not readily available.

[10] Beginning with 1962/63, the Governments Division's property tax data are thus on a fiscal year basis even though they are simply labeled 1963, etc., in the relevant tables of this report.

Taxes on personal property owned by farmers have been estimated for each year beginning with 1924.

All States publish reports that show the aggregage assessed value of taxable personal property. The general procedure used in estimating the total personal property taxes levied in each State in each year has been to obtain, from these reports, the assessed values of personal property and then to multiply these figures by applicable tax rates. Some State reports show separately the assessed values of several classes of farm personal property. It is assumed that some of them, such as livestock and farm machinery, are owned entirely by farmers. Values of others, such as automobiles, household goods, and personal effects are allocated to farmers in several ways.[11] At 10-year intervals, annual estimates are adjusted to Census data. Straight-line interpolation between the Census base years is used to adjust the annual estimates.

As noted above, the Governments Division's property tax data series is on the basis of taxes collected (calendar year basis until 1962, and fiscal year basis beginning with 1962/63). However, the USDA farm real estate and farm personal property tax series are on a calendar year basis for taxes levied in that particular year. Because of this, whenever the two series are compared in this report, the farm tax data are lagged 1 year from the way they usually appear in USDA publications. This allows time for the farm taxes to be actually collected and makes the data comparable to the Census series.[12]

Both the farm real estate and farm personal property tax series have recently been updated and revised (*48*, *50*). This makes it an especially opportune time to examine the farm property tax in a historical perspective.

ANALYSIS

The analysis centers around three major thrusts. First, property-tax-incidence theory is reviewed for background purposes. Second, some property tax comparisons are drawn between the agricultural and nonagricultural sectors. Third, some internal agricultural sector changes are analyzed as they have bearing on the property tax.

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[11] Detailed information on how both the farm real estate and farm personal property tax series are estimated may be obtained from (*65*).

[12] Compared with the Governments Division's property tax series, the USDA farm tax series are lagged 1 year prior to 1962 and 6-months thereafter. This is because of the Governments Division's switch to a fiscal year basis in 1962/63. Thus, 1961 USDA taxes levied data are compared with 1962 Census taxes-collected data, etc., prior to 1962. After 1962, the 1963 USDA taxes levied data are compared with the 1963/64 Census taxes-collected data, etc. The shortening of the lag time may reflect actual conditions to a large degree since the interval between property tax assessment and collection has shortened through the years. It is now only a few months in many States (*13*). The lag problem affects only comparisons between the agricultural and nonagricultural sectors. Thus, it affects only tables 1, 6, 7, and 8 below and related discussion since much of other analysis is internal to the agricultural sector.

PROPERTY TAX INCIDENCE REVISITED

Tax incidence theory is a complex area of public finance where economists traditionally have expressed a wide range of views. This results both from differing philosophies and from the difficulty of assessing the final resting place of the tax burden empirically—even when no theoretical disagreements exist. Buchanan notes that post-Marshallian positive analysis in public finance was restricted almost entirely to theories of tax shifting and incidence (*9*, p. 383). He also notes that Marshall himself recognized that the theory of tax shifting was an excellent instrument for applying the principles of competitive price theory.

Comparative statics offered an acceptable predictive framework for analyzing tax alternatives (*9*, p. 383). These factors allowed a considerable amount of economic literature to be generated in the tax incidence field through the years. At the same time, voluminous literature on the property tax was emerging. Lynn notes that the sustained attention on the U.S. property tax by fiscal scholars has generated a volume of literature that ". . . appears to be second in quantity only to that generated by the confrontation of the American scholar with the antitrust laws" (*31*, p. 7).

Tax incidence is important to policymakers and has undergone extensive analysis because of the need to distinguish between the legal and the economic consequences of a tax. Legal incidence of a tax refers to the individuals or firms who are responsible under law for remitting tax dollars to the government. Economic incidence refers to the individuals who actually have their income reduced by the tax. Legal and economic incidence differ whenever the legally responsible taxpaying unit can shift the tax to someone else by raising product prices, decreasing taxes paid to another level of government, or any of a host of other ways. Taxes may be shifted from the agricultural sector to another productive sector or vice versa. Also, they may be shifted from agriculture to owners of resources or to consumers.

Economic incidence is the relevant concept for examining policy-related questions. Problems such as analyzing the tax burden of individuals by income class or occupation and the effect of taxes on the returns to the agricultural sector require use of economic incidence because these topics refer to the taxpaying units that actually have their resources reduced by taxes. Remaining references to tax incidence should be understood as referring to economic incidence.

The significant volume of material on property tax incidence makes any summary of past and current thinking in the area difficult. Outside the core materials the preferences and nuances of individual authors are considerable. Other considerations, such as type of incidence, factors of production being considered, long run versus short run, and the firm versus the industry or national view, also play an important role. In addition, recent years have seen much rethinking by many economists regarding the exact nature of property tax incidence.

The intent in this section is to recap global property tax incidence—both

the traditional and current views. The focus is on the revenue side; expenditure impacts are not explored.

Traditional View

The traditional analysis of the property tax burden has been rooted in the theory of supply and demand and primarily treats the tax as an excise tax. To facilitate analysis, the discussion is divided into three parts—land, buildings and improvements, and personalty.

Land. The idea that the property tax burden on unimproved land falls on the owner whenever the tax is imposed or increased has been accepted by most economists since Ricardo. This view stems from the proposition that any tax levied on a commodity in fixed supply will be borne by the owners.

This concept has traditionally been shown via diagrams in economic texts by assuming that the supply of land is perfectly inelastic and that the demand curve is the usual one, sloping downward to the right. Any tax that is imposed simply depresses the price of land by the entire amount of the tax. The only instance under which property taxes might be shifted to users would be under highly concentrated ownership, where prices had been below the profit maximizing level, and if the owners used an increase in taxes as an excuse to raise prices. In reality, however, land ownership is widely diffused so that the competitive model typically holds.

Essentially, such a property tax is simply a tax on site value—a concept that has received much attention in the literature since the writings of Henry George in the late 1800's. Insofar as the tax falls on land, it will cause a one-time decline in the price of land and a capital loss to the owner at the time the tax is imposed or increased. This occurs because (1) the quantity of land is fixed, (2) potential renters need to bid no more for the land than before the tax was imposed, since the owner must rent the land to someone (even himself),[13] and (3) potential buyers will be willing to pay less since they will now be liable for the tax and their potential income will be no larger.

Once increased, the property tax rate has no further effect until it is again changed. New buyers pay the land tax in a nominal sense in that they write a check for the annual bill. But, they do not bear the burden in any actual sense because the tax caused the purchase price of the land to decrease by an amount adequate to compensate for the expected tax payments. Thus, there is widespread agreement that the owner at the time the tax is first imposed ultimately pays the property tax on site value.

An ad valorem property tax on the full value of land viewed as an object is proportional. However, when viewed from the more important perspective of who owns the land, the nature of the "gressivity" depends on the distribution

[13] Potential renters will bid no more for the land than before the tax was imposed because their bids are based on the income they can receive from the land, and such income remains the same. Because the supply is fixed, shifts in the demand curve determine any change in rent.

of land ownership by income class. Aaron views the tax on site value as being progressive (2, pp. 19-20). This may be true for the economy as a whole, but there is some doubt whether this is the case for the agricultural sector.[14]

Buildings and Improvements. Land by itself typically represents only a portion of the value of any property. Housing and other buildings of various quality may be constructed on the land. Even strictly agricultural land may include major improvements in the form of such items as drainage, irrigation, fertilizer, fencing, clearing, grading, and terracing.

The traditional view is that the supply of buildings and improvements is not fixed, having the typical slope of the supply curve (upward to the right). Any amount of capital for improvements is available in the long run at a cost determined by the comparative productivity of capital in other uses. It is true that the supply of buildings and improvements is somewhat rigid in the short run, but in the longer run owners of real property must pay property taxes on structures and improvements through higher sales prices (and imputed rents in the case of owner-occupants). In the long run, an increase in property taxes will shrink the stock of buildings and improvements, forcing up their rental prices.

The adjustment process in the beginning parallels that of a tax on land in that an increase in taxes will initially impact owners, reducing their net income. The longrun result of the imposition of such a tax is that the stock of buildings and improvements become less valuable than would have been the case in the absence of the tax. The stock is reduced in supply and users will pay higher rents for the restricted costs of the capital embodied in them, plus property taxes.

According to the traditional view, the property tax on structures is not capitalized because they must be renewed occasionally. The price of buildings and improvements (exclusive of taxes) is determined, rather, by construction and maintenance costs. The tax is simply a part of the gross cost for the users of the buildings and improvements.

The traditional approach suggests that non-land property taxes are borne by consumers in proportion to their purchases of the goods and services produced by the taxed buildings and improvements. Property taxes on residential structures are borne in proportion to housing expenditures, actual or imputed. Specifically, homeowners bear the property tax directly in their capacity as occupants and are unable to shift it. Owners of rental housing shift the tax in large part to tenants, who bear the tax in proportion to rents paid. A portion of the price of all goods produced (even in part) using non-residential (business) property would consist of the property taxes on buildings and improvements directly or indirectly utilized in the production of these goods. Owners of such business property thus pass on to final consumers a sizable por-

[14] The analysis presented in connection with table 2 below will provide further information on this issue.

tion of non-residential property taxes.[15] The remainder is a burden on capital income.

In short, the burden of property taxes can be allocated on non-residential structures according to both family consumption and capital income and the burden of residential property taxes on the basis of housing expenditures. The ratio of consumption to income decreases as income increases and, because of this, so does the ratio of property tax burdens to income. Thus, according to the traditional approach, the property tax is regressive.

Personalty. Farm personal property taxes are levied on four major categories of property—livestock, farm machinery, motor vehicles, and household goods (*48*). The first three of these categories are largely producer durables and other capital. The property tax burden on these three categories of property rests in large part with capital income (i.e., the owners) and to a lesser extent on the consumer. The reasoning parallels that of general business-property taxation incidence, but the exact allocation varies according to the situation.

Netzer believes that much of the personal property tax is passed on to final consumers, but it is doubtful if this holds in the agricultural sector because of the many small firms selling products in a competitive national market. Hady thus allocated the burden of the farm personal property tax to landowners (owner-operators and landlords) (*22*). Netzer does mention the possibility of forward shifting to consumers when a few farm States with similar personal property tax provisions produce most of the output of a particular farm commodity. But, only wheat is used in the illustration (*40*, p. 157).

Taxes on household goods (consumer durables) are thought by most economists to rest on the owners rather than being shifted backward to producers of these goods (*22*, p. 370; *40*, p. 39). Since taxpayers do not sell household goods as a business they have little opportunity to shift forward a tax on such goods. This applies in the farm sector. Also, a portion of the farm motor-vehicle expenses are for consumption and must be regarded as a household payment for consumer durables. The final resting place of the personal property tax on household vehicles is thus thought to be largely on the owners (*40*, pp. 39, 156). Moreover, the demand for automobiles is thought to be quite inelastic so the personal property tax on them does not significantly reduce purchases or produce much backward shifting to suppliers (*40*, p. 156).

Current View

Since about 1960, there has been a change in the approach used by many economists to analyze tax incidence (*45*, p. 26). A more consistent framework for tax incidence analysis has been developed, even though differences of opinion among economists about incidence still exist. This new approach follows the work of such economists as Harberger, Mieszkowski, and Musgrave

[15] Half, according to the Musgraves, (*39*, p. 367) and different fractions depending on the type of property, according to Netzer (*40, 41*). The ability to pass the tax on to consumers depends in part upon the market power of the various industries or sectors.

(*24*, *33*, *34*, *35*, *37*). There were a few predecessors even to this more recent work, as noted by Mieszkowski in his 1972 paper (*35*). Harberger's classic analysis dealt with the corporate income-tax incidence, but elements of the approach have relevance to the property tax (*24*).

In short, the recent revisionist view of property tax incidence holds that the initially lower return rate on improvements to property does not offset the total level of investment but simply steers investment into sectors of the economy that are less heavily taxed. This leads to an overall lower rate of return on all investment and, according to this approach, the property tax is ultimately borne by the owners of capital (*2*). Even the Richardian view that landowners bear the tax on site value has been challenged by some economists who argue that investors have no place to flee when a tax is simultaneously imposed on land and reproducible capital. Thus, the resultant rate of return is reduced on all capital, including land (*45*, p. 36).

The beginning point in this theoretical analysis is a uniform tax on the value of all land and capital goods. Such a tax cannot be shifted but must be borne in full by owners of capital goods since it cannot be avoided by shifting assets to untaxed sectors or by raising prices. Such a tax reduces the yield on capital to each owner, but does not alter the profit-maximizing price or output. The burden of this tax would be distributed in proportion to the ownership of assets.

In the real world, the property tax is not a uniform tax on land and capital. Some categories are entirely exempt and rates vary. While the initial impact of variations in tax rates may follow the traditional analysis, the final result is different according to the new approach. The supply of land under any one particular use is not viewed as fixed, according to the new approach. The imposition of a new or higher tax on land and capital in any one jurisdiction will cause investors to shift resources in the longer run to lower tax areas, reducing the average return on capital throughout the economy. The exact distribution of this burden depends upon a number of considerations such as ease of factor substitutability, factor mobility, size of market area, and shifts in demand when relative commodity prices change (*2*, pp. 42-43).

Because the property tax burden under the new view is distributed in proportion to asset ownership, it is important to look at the distribution of the ownership of wealth. Evidence suggests that capital ownership is concentrated in the higher income brackets (*4*, pp. 32-33). Thus, under the new view of property tax incidence, any reduction in the rate of return to capital assets as a result of the property tax causes a progressive distribution of the tax burden.

Some taxpayers with low current income possess significant property holdings, however. The result is that, even when the property tax is viewed as being borne solely by capital, the resultant tax burden by income class follows a U-shaped distribution (*2*, pp. 45-57; *4*, p. 33). Thus, the overall progressivity is tempered somewhat in the lower to lower-middle income brackets.

The current view has made a substantial impact on public finance economists. For example, most such economists now view the property tax as

somewhat less regressive than formerly thought. Some have come to view it as patently progressive (*15*).

The discussion continues, however, and the new view has its critics. The debate centers around a number of issues including the beginning point of the analysis under the new view (the unrealistic assumption of a uniform national property tax), permanent versus annual income for analyzing regressivity, the nature of factor supplies, the role of government, the initial tax structure, and the market power of the industry and firms involved.[16] One way of resolving the analytical problems that arise from the differing views is to derive results under a range of assumptions. This, for example, is what Pechman and Okner did with their national tax model where eight assumption variables were employed (*45*). The only problem with this approach is that analysis using multiple assumptions can potentially become as confusing or misleading as limited or no analysis.

One important consideration for the agricultural sector is the amount of property tax shifting to consumers. This shift has been mentioned in a general context above, but it has more important specific implications for agriculture. If market power enables firms or an industry to pass the property tax to consumers, one has a situation more analogous to the traditional excise tax perspective of property tax incidence and the tax will be regarded as regressive. But, if the tax cannot be passed forward and must be absorbed by owners of capital, the situation is like the revised incidence view with a more progressive impact by income class, and other conclusions necessarily follow (*45*, pp. 35-36).

One finds a variety of explanations for property tax shifts between the agricultural and the nonagricultural sectors in the literature. For example, the Advisory Commission on Intergovernmental Relations (ACIR) cites a 1972 study by the New Jersey Tax Policy Committee that assumed that all property taxes on businesses and farms were shifted forward to consumers (*4*, pp. 170-171). But this appears to be an extreme view.

In reviewing the property tax, Netzer states: "The conventional wisdom surely overstates the degree of forward shifting" (*41*, p. 527). He notes that, to the extent that there is less forward shifting, more of the burden falls on owners of land and capital (*41*, p. 527). Such changes in shifting assumptions will lead to generally more progressive results. He believes that half or less of business, nonresidential, reproducible capital (including farm) property taxes are shifted forward (*41*, p. 534).

Musgrave notes that it is an issue of market power and that in his view less than one-third of the property tax on nonhousing property is shifted (*36*, p. 225). The Musgraves note that farms and personal property are unlikely to offer much option for administered pricing and hence for forward shifting of property taxes to consumers (*39*, p. 418).

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[16] For a detailed look, see the discussion following the papers by Aaron (*1*) and Musgrave (*36*) in the *Amer. Econ. Rev.*, Vol. 64, No. 2, May 1974, pp. 230-235.

One is led to conclude that the agricultural sector, because of its many small firms operating in a competitive market, possesses limited opportunity for forward shifting to consumers and that the revised incidence theory may have more potential importance to this sector than to much of the remainder of the economy, especially in terms of lessened regressivity.[17]

Implications

The importance of property tax incidence analysis for the discussion below is multifaceted. First, one must be aware that there typically is more complexity than first meets the eye in assigning the final resting place for any tax burden. Second, the wide range of theoretical opinion on property tax incidence forces one to recognize an array of possible outcomes regarding the final resting place of the tax. Third, even where theoretical agreement is possible, the empirical studies of property tax incidence often have been less than definitive. Thus, making policy conclusions on the basis of much of the data available—herein and elsewhere—concerning the "apparent" incidence and burden of the property tax is commonly difficult and often tenuous.

Much of the final outcome for the agricultural sector depends upon its market power when selling its products to the nonagricultural sector. Agriculture's historical lack of market power increases the potential significance of the new theoretical approach for the sector to some degree.

It should be noted that the theory also has implications for farmers as consumers. As consumers, farmers also lack market power and may be paying more than their fair share of the property tax imposed on sellers of farm inputs and consumer goods. Thus, the owners of agricultural capital may bear the brunt of the property tax when the sector is selling its products, but agricultural producers and consumers may pay a disproportionate share when the sector buys inputs and consumer goods.

This lack of market power—in both the buying and selling roles—is not likely to change significantly for the agricultural sector in the foreseeable future.

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[17] The entire subject of property tax shifting by the agricultural sector is a somewhat confused one. Netzer follows traditional logic in assuming that a property tax on the land would be borne by landowners. But he then assumes that a general tax on improvements and personal property can be expected to be shifted forward to consumers when imposed on a competitive industry ". . . confronting relatively inelastic demand like agriculture" (*40*, p. 250). This stress on the strength of inelastic demand to draw forth the agricultural property tax burden is interesting in view of the futile hope of an earlier generation of agricultural economists that inelastic demand coupled with population growth would ultimately "solve" the "farm problem."

Netzer cites studies on both sides of the shifting issue. He notes that Musgrave and Daicoff (1958) essentially follow the demand pull reasoning and assume that three-fourths of the property tax on agriculture is shifted forward to consumers and one-fourth is borne by recipients of income. But he found that Brownlee (1960) assumed that such taxes are borne entirely by farmers. A Wisconsin study (1959), he notes, assigned 75% of the farmland tax to the owner and 25% to the consumer, and divided the taxes on farm structure and personalty evenly between owners and consumers (*40*, pp. 247-251).

AGRICULTURAL-NONAGRICULTURAL SECTOR COMPARISONS

The following is a comparison of the property tax burden of the agricultural and nonagricultural sectors in a historical context. First, the focus is on the tax as a share of income flows. This stresses the ability-to-pay principle of taxation.

Second, a look is taken at the tax and stocks of wealth. Property taxation is a type of wealth taxation and a case for such taxation can be made on the grounds of both benefits received and ability to pay. Benefit considerations suggest a need for *in rem*-type property taxes on real assets, while ability-to-pay considerations indicate a need for a personal tax on net worth (*39*, p. 319).[18] The modern property tax in the United States is neither of these because of its narrower base. Moreover, it should be recognized that in the final analysis the entire tax burden must be borne by individuals. Taxes may be collected from business firms, but the ultimate burden must be traced to individual households in their roles as owners of businesses, as employees, or as consumers.

Income Basis

The total U.S. property tax bill was $51.5 billion in 1975. Farm property taxes totaled $3.1 billion or 6.0 percent of the U.S. total that same year. Farm real estate taxes comprised 85.6 percent of the 1975 farm total, with farm personal property taxes making up the balance. Farm real estate taxes were 87.8 percent of the farm total in 1927 (table 1).

The farm real estate tax and the total U.S. property tax bills increased 23.0 and 71.9 times, respectively, during the 1902-75 period. Farm real estate taxes as a share of U.S. total property taxes declined from 15.7 percent in 1902 to 5.2 percent in 1975.

Most data series must be compared on the basis of a shorter time span due to data limitations in the earlier years. Thus, total farm property taxes declined as a share of U.S. property taxes from 12.7 percent to 6.0 percent between 1927 and 1975. (A short-lived increase occurred, from 12.7 percent to 13.1 percent, between 1927 and 1932 before the longer term decline set in.) Farm personal property taxes as a percentage of all U.S. property taxes decreased from 1.5 percent to 0.9 percent during the same period, but peaked at 2.4 percent in 1952-53 during the interim. This reflects the relative decline of personal property taxation in the U.S. property tax structure through time.

A common standard for the appraisal of taxes is that of economic neutrality among industries, inputs, and locations. According to Netzer: "Net output, or national income originating, is perhaps the most satisfactory readily available statistic with which to measure neutrality" (*40*, p. 26). National income (NI) is an especially appropriate basis of tax neutrality comparison by sector

[18] *In rem* taxes are imposed on objects or activities independently of the characteristics of the transactor or owner. They may be contrasted with personal taxes which are adjusted to the taxpayer's personal ability to pay.

Table 1—Total property taxes, farm property taxes, and national income, United States, selected years, 1902-75[1]

Year	Total property taxes	Farm real estate taxes	Farm personal property taxes	Total farm property taxes	Farm real estate taxes/Total property taxes	Farm personal property taxes/Total property taxes	Total farm property taxes/ Total property taxes	National income from farming/ National income	Total property taxes/ National income	Total farm property taxes/ National income, farm sector	Total nonfarm property taxes/ National income, nonfarm sector
	Million dollars				*Percent*						
1902	706	150.5	N/A	N/A	15.7	N/A	N/A	N/A	3.4	N/A	N/A
1913	1,332	191.2	N/A	N/A	14.4	N/A	N/A	N/A	3.8	N/A	N/A
1922	3,321	389.7	N/A	N/A	15.7	N/A	N/A	N/A	5.3	N/A	N/A
1927	4,730	525.6	73.0	598.6	11.1	1.5	12.7	N/A	5.8	N/A	N/A
1932	6,087	526.1	62.5	588.6	11.7	1.4	13.1	8.0	10.6	17.4	10.0
1934	6,076	398.4	39.3	437.7	9.8	1.0	10.7	6.5	8.4	10.6	8.2
1936	6,093	392.3	42.0	434.3	9.6	1.0	10.6	6.7	6.4	7.7	6.2
1938	6,440	404.8	47.1	451.9	9.1	1.1	10.2	6.8	6.7	7.8	6.6
1940	6,430	406.8	49.1	455.9	9.2	1.1	10.3	7.5	5.6	7.6	5.4
1942	6,537	406.7	56.1	462.8	9.0	1.2	10.2	8.8	3.3	3.9	3.3
1944	6,606	400.2	76.8	477.0	8.7	1.7	10.4	7.8	2.5	3.4	2.5
1945	6,802	418.9	80.4	499.3	8.7	1.7	10.4	8.3	2.7	3.4	2.6
1946	6,986	464.8	91.5	556.3	9.3	1.8	11.2	10.5	2.9	3.1	2.8
1947	7,507	518.7	98.5	617.2	9.4	1.8	11.2	9.5	2.8	3.4	2.8
1948	8,136	605.4	127.7	733.1	9.9	2.1	12.0	9.6	2.8	3.5	2.7
1949	8,862	696.0	190.1	886.1	9.6	2.2	11.8	7.5	3.2	5.1	3.1
1950	9,369	706.2	166.5	872.7	9.6	2.3	11.9	7.2	3.1	5.2	3.0
1951	9,926	742.4	176.9	919.3	9.4	2.3	11.6	7.1	2.9	4.8	2.8
1952	8,652	776.7	208.8	985.5	9.0	2.4	11.4	6.4	3.0	5.4	2.9
1953	9,375	810.6	228.6	1,039.0	8.6	2.4	11.1	5.6	3.1	6.4	2.9
1954	9,967	846.9	221.4	1,068.3	8.5	2.2	10.7	5.2	3.3	6.9	3.1
1955	10,735	878.4	216.0	1,094.4	8.2	2.0	10.2	4.6	3.3	7.5	3.1
1956	11,749	931.2	223.0	1,154.2	7.9	1.9	9.8	4.2	3.4	7.9	3.2
1957	12,864	974.2	219.4	1,193.6	7.6	1.7	9.3	4.0	3.6	8.2	3.4
1958	14,047	1,032.1	228.2	1,260.3	7.3	1.6	9.0	4.6	3.9	7.5	3.7
1959	14,983	1,080.7	247.9	1,328.6	7.2	1.7	8.9	3.6	3.8	9.2	3.6
1960	16,400	1,156.7	274.0	1,428.7	7.0	1.7	8.7	3.8	4.0	9.2	3.8
1961	18,080	1,243.1	286.1	1,529.2	6.9	1.6	8.5	3.8	4.2	9.5	4.0
1962	19,054	1,311.0	297.5	1,608.5	6.9	1.6	8.4	3.6	4.2	9.8	4.0
1963	19,833	1,372.2	304.1	1,676.3	6.9	1.5	8.5	3.4	4.1	10.3	3.9
1964	21,341	1,417.2	320.2	1,737.4	6.7	1.5	8.2	2.9	4.1	11.4	3.9
1965	22,581	1,466.7	331.3	1,798.0	6.5	1.5	8.0	3.2	4.0	10.1	3.8

See footnotes at end of table.

—Continued

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Table 1--Total property taxes, farm property taxes, and national income, United States, selected years, 1902-75[1]--Continued

Year	Total property taxes	Farm real estate taxes	Farm personal property taxes	Total farm property taxes	Farm real estate taxes/Total property taxes	Farm personal property taxes/Total property taxes	Total farm property taxes/ Total property taxes	National income from farming/ National income	Total property taxes/ National income	Total farm property taxes/ National income, farm sector	Total nonfarm property taxes/ National income, nonfarm sector
	Million dollars				*Percent*						
1966	38,870	1,535.7	338.7	1,874.4	4.2	1.4	7.6	3.1	4.0	9.8	3.8
1967	34,047	1,733.8	367.4	2,001.2	4.3	1.4	7.7	2.7	4.0	11.3	3.8
1968	33,347	1,730.5	385.5	2,116.0	4.2	1.4	7.6	2.5	3.9	11.7	3.7
1969	30,673	1,881.8	402.8	2,284.6	4.1	1.3	7.4	2.7	4.0	11.2	3.8
1970	34,054	2,050.8	388.3	[illegible]	6.0	1.1	7.1	2.6	4.3	11.7	4.1
1971	37,852	2,169.1	402.8	2,571.9	5.7	1.1	6.8	2.5	4.4	12.0	4.2
1972	42,133	2,375.2	409.3	2,784.5	5.6	1.0	6.6	2.7	4.4	10.7	4.2
1973	45,283	2,462.7	424.9	2,887.6	5.4	0.9	6.4	3.9	4.3	6.9	4.1
1974	47,705	2,513.7	420.1	2,933.8	5.3	0.9	6.2	3.2	4.2	8.0	4.1
1975	51,491	2,651.8	444.3	3,096.1	5.2	0.9	6.0	3.1	4.3	8.4	4.1
Total[2]	661,439	44,673.3	8,928.1	52,790.0	6.8	1.4	8.0	4.0	4.0	7.9	4.0

N/A = Not available.

[1] Includes Alaska and Hawaii beginning with 1960. [2] Based on years for which data are available.

Source: (4, 44, 55, 58, 59, 60).

since it reflects earnings by the factors of production. Indirect business taxes—and the property tax is treated as such in the national income accounts—are in addition to the earnings of the factor suppliers. National income originating in farming (NIF) was 8.0 percent of all NI in 1932 and 3.1 percent in 1975 (table 1). The high was 10.0 percent in 1946 and the low was 2.5 percent in 1968 and 1971, but the long-term trend was one of declining relative importance of the farm sector as a source of NI.

Total property taxes as a percentage of NI were 3.4 percent in 1902, increased to 10.6 percent during the depths of the Great Depression (1932), decreased to a low of 2.5 percent during 1944, and increased with minor intervening fluctuations to 4.3 percent in 1975 (table 1).[19] Total farm property taxes as a percentage of NIF decreased from 17.4 percent in 1932 to 8.4 percent in 1975 with intervening fluctuations between 3.1 percent (1946) and 12.0 percent (1971). Total nonfarm property taxes as a percentage of national income originating in the nonfarm sector (NINF) declined from 10.0 percent in 1932 to a low of 2.5 percent in 1944 and ended the period in 1975 at 4.1 percent. Thus, the importance of property taxes as a percentage of NI (including NINF) has fluctuated through time, with no strong trend apparent. However, for the agricultural sector property taxes as a percentage of NIF tend to increase during periods of weak demand and relatively low farm prices.[20]

The crux of the whole tax neutrality matter for the agricultural sector can be settled by comparing all data on the basis of a common time period. Data are available for all series since 1932 (table 1). These show that for the 1932-75 period farm property taxes accounted for 8.0 percent of all property taxes, but that NIF was only 4.0 percent of total NI. During the same time span, property taxes took 7.9 percent of NIF and only 4.0 percent of NINF.

The changes throughout the 1932-75 period also are of interest. In 1932, the ratio of the percentage of property taxes paid by farmers divided by the percentage of national income originating in farming was 1.64. It was 1.94 in 1975 but never went below 1.12 (1946) or above 3.04 (1968) during the 1932-75 span. Similarly, ratios can be constructed which show the share of NIF comprised of farm property taxes divided by the share of NINF made up of nonfarm property taxes. This was 1.74 in 1932 and 2.05 in 1975, but ranged from a low of 1.11 in 1946 to a high of 3.16 in 1968.

All these calculations indicate that the agricultural sector has been paying proportionately more of the Nation's property tax bill than has the nonagricultural sector, when this burden is compared with the two sectors' respective shares of NI.[21]

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[19] National income statistics have been officially reported regularly for the years since 1929, but data for earlier years have been estimated unofficially (*60*).

[20] This reflects the fact that the property tax is relatively income inelastic—especially to decreases in income.

[21] This is true despite the recognition that any comparison of taxes and incomes between the agricultural and nonagricultural sectors is likely to be biased to some degree, because unrealized capital gains are apt to be somewhat larger in the agricultural sector than in the remainder of the economy.

A number of concepts have been advanced in the literature regarding the reasons for non-neutrality of taxes. Netzer states that the property tax is not neutral among industries for ". . . whatever the reason: whether it is related to differences in capital-output ratios, in the profitability of investment reached by the property tax (which is not quite the same thing); in geographic location, or in property tax coverage and administration" (*40*, p. 26). There are other factors which can play a role as well, and despite Netzer's pessimism, it would be appropriate to pursue a couple of them, regressivity and relative capital intensity.

Regressivity. Available data on the per capita personal income of the farm population extend back to 1934. They show that the per capita personal income of the farm population has typically been less than that of the nonfarm population (*63*). Thus, other factors being equal, the farm population would pay a disproportionate share of the property tax if one viewed the tax as being regressive. This was the case according to traditional property tax incidence theory. According to this theory it was held that the property tax basically was an excise tax ultimately borne largely by renters and consumers, and that the best yardstick of ability to pay was the annual flow of household money income. It followed that the property tax was regressive because consumption is a relatively more important component of the budgets in low-income households.

Based on these theoretical underpinnings, the idea that the property tax is regressive has been widely accepted throughout the 20th century (*2*, p. 2). The literature which takes this viewpoint for granted is extensive (*1*, p. 212). Gaffney maintains that today's current concept of regressivity owes much to the data, assumptions, and approach involved in the work of Musgrave, Carroll, Cook, and Frane (*38*), which was published in 1951 (*15*, p. 411). In recent years, four important empirical studies—Netzer (1966), the Musgraves (1973), ACIR (1973), and Pechman and Okner (1974)—have shown the property tax to be regressive (*4, 39, 40, 45*). This line of reasoning would lead one to conclude that the agricultural sector probably pays more than its share of the property tax bill, mainly because of the regressive nature of the tax.

But how would the agricultural sector fare comparatively under the "revisionist" theory of property tax incidence? This view holds that the tax is ultimately borne by the owners of capital. Because capital ownership is largely concentrated in the higher-income brackets, any reduction in the rate of return to capital caused by the imposition of a property tax must result in a progressive distribution of the tax burden (*15*).

The question still remains how the agricultural sector would fare in a comparative sense even under the revisionist assumptions. The answer depends upon the relative distribution of capital ownership between the agricultural and nonagricultural sectors by income level. Available evidence suggests that there is a much higher ratio of wealth to income in the agricultural sector (table 2). Moreover, internal agricultural sector wealth is skewed much more toward the lower end of the income scale than is the case for the U.S. economy as a whole.

Table 2—Ratio of wealth to income, agricultural households, 1966, and U.S. households, 1962

Agricultural households 1966[1]		U.S. households, 1962	
Income bracket	Ratio of net worth to income	Income bracket	Ratio of net worth to income
$0 - 2,499	29.14	$0 - 2,999	4.8
2,500 - 4,999	10.70	3,000 - 4,999	2.5
5,000 - 9,999	6.87	5,000 - 7,499	2.1
10,000 - 14,999	5.40	7,500 - 9,999	2.2
15,000 - 24,999	7.55	10,000 - 14,999	2.3
25,000 or more	8.00	15,000 - 24,999	3.5
		25,000 - 49,999	8.4
		50,000 - 99,999	10.7
		100,000 and over	10.7
		All incomes	3.3

[1] Data includes off-farm income and off-farm wealth in net worth statements.

Sources: (*4*, p. 32; *10*, p. 39).

This would tend to negate a substantial part of the progressivity of the property tax for this sector under the new theoretical view of property tax incidence. It follows, under the new approach, that the agricultural sector could still end up paying more than its share of the tax due to comparatively more wealth at the lower income levels.

Pasour's recent study of the capitalization of farm property taxes for the United States using 1969 data found little evidence of farm real estate tax regressivity (*44*, pp. 546-547). For a tax decrease of $0.20 per $100 value under average circumstances, he found the amount of the tax capitalized into higher property values as a percentage of income for various farm sales categories was as follows: 1.19 ($2,500-$4,999), 1.21 ($5,000-$9,999), 1.30 ($10,000-$19,999), 1.19 ($20,000-$39,999), and 1.15 ($40,000 and over). Pasour lists a number of caveats regarding these findings, including the possibility of considerable variation in the burden of property taxes at any given income level due to differing capital intensities.

Critical to any analysis of tax regressivity is the income concept employed. For example, the longer the time period over which income is measured, the less likely it is to yield a false picture of the household economic situation. Good and bad years tend to even out, giving credence to the use of a permanent income concept in studying tax incidence by income class.

Aaron notes that the use of annual income makes the distribution of tax burdens more progressive (*2*, p. 28). He feels that the evidence suggests the family consumption-income ratios by income class do not vary much if a normal income concept is used. Thus, if the traditional view of property tax incidence is followed that property taxes are born in proportion to consumption, such taxes may be proportional to normal income (*2*, p. 30).

Recent work by Paglin, which corrects for intrafamily income over the life cycle, shows that the typical Lorenz curve (based on the concepts of perfectly flat family age-income profiles and annual income) yields a Gini ratio which overstates the actual degree of interfamily income variation by 50 percent (*42*). Further research is needed to resolve the question of property tax regressivity for taxpayers in general and farmers in particular.[22]

Relative capital intensity. A perhaps more plausible reason than regressivity why the agricultural sector pays a disproportionate share of the property tax simply may be the sector's relatively greater capital intensity. Indeed, the data in table 2 hint at this explanation, showing the much greater level of wealth required in the agricultural sector to provide the same level of income as found in the rest of the economy. Unpublished USDA data show that in 1975 average investment per farm worker was $98,540; per production worker in manufacturing enterprises, $55,252.[23] (Average investment per employee—both production and management—in manufacturing enterprises was $40,277 in 1975.)

Other estimates based on a cost rather than a current value basis suggest that investment per worker in agriculture may be only about 10 percent higher than in manufacturing—not 50 to 100 percent as observers formerly believed (*49*). But this may not be a very relevant point in a tax context since property taxes must be paid on the basis of value rather than cost.

Land is an important value item in the agricultural sector and it has been appreciating rapidly in recent years thus helping cause the two series (agriculture and manufacturing) to diverge more than was the case in earlier years. In the final analysis, however, the relatively higher capital intensity of the agricultural sector apparently is one of the main reasons it pays a disproportionate share of the property tax.

Wealth Basis

A case can be made for measuring taxable capacity in terms of wealth. The property tax is a type of wealth taxation. In earlier periods it had a much broader base, making it a more suitable source of such taxation than it is today. But recent decades have seen a steady erosion of the taxation of intangibles and personality, and the increasing use of various types of low-income relief and differential arrangements. Wealth taxation can be advocated on the

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[22] ACIR recently called the property tax regressivity issue "something of a red herring" (*5*, p. 16). They argue that there would be a need for low-income property tax relief, even if the tax were progressive," if the absolute level of the tax worked a hardship on some persons" (*5*, p. 16). A resonable analogy in their view is the need for exemptions to protect subsistence income under a progressive income tax system.

[23] Based on the average number of total farm workers, including self-employed and hired, and average number of production workers for manufacturing. Agricultural assets exclude those not used in production and are valued on a current basis, i.e., an inventory of physical units is multiplied by the current market value per unit. Assets for manufacturing enterprises are compiled from financial statements of manufacturing firms and are generally values based on cost, less capital consumption. For more detail see (*49*).

basis of both benefits received and the ability to pay. The former suggests differential user charges on various items of real property, while the latter implies a global and personal tax on net worth.

If the value of an asset is viewed as reflecting the capitalized value of income flowing from it, the taxation of wealth may be regarded as equivalent to the taxation of income.[24] In a long run, the value of an asset in a perfect capital market is given by $Y = iV$, so that $V = Y/i$ where V is the asset's value, Y is the annual income derived from the asset, and i is the market rate of interest on alternative investments. It is of interest, based on the above, to analyze the industry neutrality of the property tax for the agricultural sector on a wealth basis. In other words, other things being equal, it would appear that neutrality for the agricultural sector would exist if it paid X percent of all property taxes because it accounted for X percent of the value of all taxable properties. Thus, an effort is made in this report to explore the agricultural sector property tax neutrality question in a historical context.

The analysis of comparative wealth by sector is not an easy task, however. It has already been noted in earlier analysis that the property tax base has been changing through time. Intangibles are no longer taxed in most instances and the personal property base increasingly has been exempted. In addition, the data on the value of personal property are sketchy. For this reason, this analysis of neutrality for the agricultural and the nonagricultural sector is conducted largely on the basis of real estate values. Real estate accounted for 83.1 percent of all farm property taxes during the 1927-75 period, and it has been a quite stable tax base through time.

Even when one decides to focus on real estate, difficult problems remain. It is not easy to determine what share of all land is devoted to farming and, hence, what proportion of all land values should be allocated to the agricultural sector.

Some background data can help place the situation in better perspective, however. The land area of the United States totals approximately 2,264 million acres, of which agricultural uses accounted for 1,283 million acres or 56.7 percent of the total in 1969 (*66*). Agricultural uses include land in crop rotation, all types of pasture and range, and a small acreage in closely related uses. Not all land classified as agricultural is in farms. In 1969, there were 1,063 million acres in farms or 47.0 percent of the total land area (*66*). Taxable farmland was estimated at 965 million acres in 1969 or 90.8 percent of all farmland, 75.2 percent of all agricultural land, and 42.6 percent of all the land area that same year. In 1975, taxable farmland was estimated at 979 million acres or 90.1 percent of the 1,086 million acres in farms.

Even if one had perfect land value data the problem of possible differential rates of tax capitalization between sectors would affect one's ability to draw precise conclusions about the neutrality of the property tax among different

[24] In the broadest sense, such a wealth tax could be regarded only as a tax on capital income, because wealth taxation does not include labor in its base. Labor would have to be included to obtain an equivalent of a general income tax.

industries. More specifically, consider once again the capitalization formula $V = Y/i$, where V is land value, Y is annual income earned from the land, and i is the market rate of interest. If the landowner is unable to pass the property tax on, the income stream, Y, is depressed by the amount of the tax, ultimately depressing the value of the land, V.[25] But, as was noted earlier in the theoretical discussion on incidence, the degree to which a tax is capitalized can vary by industry due to differences in factors such as market power and demand elasticity.

While there is a considerable theoretical literature on the general subject of property tax capitalization, there has been relatively little empirical work done specifically on the possible capitalization of property taxes into farm real estate values. Jensen found strong evidence of capitalization in the period of rising property taxes during 1919-24 (*26*, pp. 69-75). Netzer reports on a 1961 study by Daicoff in a Michigan county using 1951-57 data which found little evidence of capitalization (*40*, p. 34). Work by Schuh and Scharlach in Indiana showed property tax increases were linked with declines in farm real estate values (*47*).

The most recent and definitive work on the capitalization question has been done by Pasour. He found in separate studies for North Carolina and the United States, using 1969 data, that changes in property taxes are largely capitalized into farm real estate values (*43*, *44*).

Thus, most studies have demonstrated some degree of property tax capitalization. Probably most farm real estate values have been affected somewhat by such property tax capitalization. Still one does not know how the degree of such capitalization compares with that found in the nonagricultural sector.

Wealth defined. There have been a number of attempts to establish gross wealth valuations in the U.S. economy by sector.[26] While the number of such inquiries is limited, they can give at least a hint at the relative importance of the wealth of the agricultural sector. Here, the central purpose is to obtain suitable wealth estimates for the Nation and the agricultural sector; residuals constitute the nonagricultural sector. Wealth is taken to mean all tangible or physical assets, chiefly land, structures, subsoil assets, producer durables, consumer goods in households, inventories, and monetary gold and silver. Excluded from this concept of wealth are all financial assets (corporate stocks, corporate and foreign bonds, mortgages and notes, government bonds, life insurance equity, and cash) and net foreign assets. These items, which consti-

[25] Full capitalization thus occurs when the price of the property bearing the tax falls below that of otherwise equally valuable property by an amount to make the total cost of owning them the same. When property tax differentials are generated and capitalized they cause one-time capital losses (or gains) in property values. If current owners acquired the property after the new or increased tax was levied, they do not bear the ultimate burden of the tax because it already had been capitalized and was reflected in a lower acquisition price at the time of purchase. Subsequent removal or reduction of the tax would grant the current owners capital gains in such a case but would not repay the capital losses suffered by the original owners.

[26] Gross wealth (or worth) means the market value of an item of wealth without regard to any mortgages, claims, or liabilities against the asset.

tute intangible personal property, are typically excluded from or constitute a very small portion of, the property tax base.[27] Also, any discussion of financial wealth requires a detailed analysis of net worth, which is beyond the scope of this study.

Other components of national wealth that are not included in the data for this report are human capital (i.e., capitalized net earning capacity), consumer holdings of semidurable and perishable commodities, works of art and collector's items, land improvements, and soil depletion.[28] The reason for most of these exclusions is measurement problems. Goldsmith further argues that human capital ought to be omitted because it is nontransferable, i.e., it is not an item that can be sold in a non-slavery economic system (*18*, p. 49).

Wealth estimates. In this section, the operational definition of wealth, the techniques of wealth estimating, and the data are discussed. A number of authors have estimated "net private domestic" wealth (table 3). This definition focuses on the wealth most likely to constitute the property tax base. "Net" refers to net of depreciation. "Private" means that wealth owned by Federal, State, and local governments is excluded. "Domestic" indicates that only wealth owned by U.S. residents located within the geographical boundaries of the United States is included. Values are in current prices.

There are three major problems with the boundaries of these data. First, a problem occurs with domestic wealth owned by foreign nationals but located within the United States. These items would be subject to the property tax, but the Goldsmith and Kendrick estimates exclude them, providing only "net foreign balance." The data could not be adjusted because the relevant sectoral data are limited to 1929, 1939, and 1946, making it difficult to interpolate or project forward U.S. wealth owned by foreigners (*46*). Relative to national wealth, this item is small.[29]

The second problem is the monetary gold and silver item. Such a line item does not exist in the wealth data pertaining to agriculture, except perhaps as "cash holdings." Because it is not comparable between the USDA and the other national estimates, it is deleted in this study as a possible source of error. The most recent Kendrick data do not list monetary gold and silver as a separate line item, so it is estimated using Goldsmith data and netted out. It, too, is a relatively small component of national wealth, and it has decreased over time.

The third problem concerns U.S. possessions and territories whose wealth is included in these national wealth estimates but not in the agricultural

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[27] The 1972 Census of Governments (*56*) listed 16 States as taxing intangible personal property. Only five States provided data on assessed values of intangible property. Netzer (*40*, p. 142) estimated that in 1961, intangibles constituted 4 percent of the local general property tax base before exemptions. Even less information exists on revenues from the tax on intangibles.

[28] Perishable and semidurable commodities are defined to have an expected asset life of less than 3 and 6 months, respectively (*16*, p. 11).

[29] For more information on this problem, see (*46*).

Table 3—Summary: Estimates of domestic net private tangible wealth of the United States, in current prices, selected years, 1900-75

Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]
			Billion dollars			
1900	80.0	79.2	82.3	N/A	82.3	N/A
1901	83.8	N/A	N/A	N/A	N/A	N/A
1902	89.9	N/A	N/A	N/A	N/A	N/A
1903	94.9	N/A	N/A	N/A	N/A	N/A
1904	99.2	N/A	N/A	N/A	N/A	N/A
1905	106.5	N/A	N/A	N/A	N/A	N/A
1906	115.3	N/A	N/A	N/A	N/A	N/A
1907	121.9	N/A	N/A	N/A	N/A	N/A
1908	125.0	N/A	N/A	N/A	N/A	N/A
1909	131.5	N/A	N/A	N/A	N/A	N/A
1910	137.8	N/A	N/A	N/A	N/A	N/A
1911	142.7	N/A	N/A	N/A	N/A	N/A
1912	149.3	147.5	N/A	N/A	151.2	N/A
1913	155.2	N/A	N/A	N/A	N/A	N/A
1914	158.6	N/A	N/A	N/A	N/A	N/A
1915	172.5	N/A	N/A	N/A	N/A	N/A
1916	204.5	N/A	N/A	N/A	N/A	N/A
1917	248.7	N/A	N/A	N/A	N/A	N/A
1918	285.9	N/A	N/A	N/A	N/A	N/A
1919	341.6	N/A	N/A	N/A	N/A	N/A

See footnotes at end of table

Continued

Table 3—Summary: Estimates of domestic net private tangible wealth of the United States, in current prices, selected years, 1900-75—Continued

Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]
			Billion dollars			
1920	342.0	N/A	N/A	N/A	N/A	N/A
1921	297.4	N/A	N/A	N/A	N/A	N/A
1922	301.6	298.0	N/A	N/A	293.2	N/A
1923	322.0	N/A	N/A	N/A	N/A	N/A
1924	330.9	N/A	N/A	N/A	N/A	N/A
1925	346.3	N/A	N/A	N/A	N/A	N/A
1926	359.6	N/A	N/A	N/A	N/A	N/A
1927	373.1	N/A	N/A	N/A	N/A	N/A
1928	388.5	N/A	N/A	N/A	N/A	N/A
1929	395.6	391.4	382.7	376.2	382.6	327.7
1930	365.9	N/A	N/A	N/A	N/A	N/A
1931	317.4	N/A	N/A	N/A	N/A	N/A
1932	280.0	N/A	N/A	N/A	N/A	N/A
1933	283.8	279.8	N/A	N/A	275.1	N/A
1934	289.0	N/A	N/A	N/A	N/A	N/A
1935	288.7	N/A	N/A	N/A	N/A	N/A
1936	306.6	N/A	N/A	N/A	N/A	N/A
1937	319.8	N/A	N/A	N/A	N/A	N/A
1938	317.9	N/A	N/A	N/A	N/A	N/A
1939	323.8	304.0	N/A	N/A	321.3	N/A

See footnotes at end of table.

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Table 3—Summary: Estimates of domestic net private tangible wealth of the United States, in current prices, selected years, 1900-75—Continued

Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]
			Billion dollars			
1940	344.2	N/A	N/A	N/A	N/A	N/A
1941	385.5	N/A	N/A	N/A	N/A	N/A
1942	409.7	N/A	N/A	N/A	N/A	N/A
1943	425.5	N/A	N/A	N/A	N/A	N/A
1944	440.9	N/A	N/A	N/A	N/A	N/A
1945	470.3	448.3	N/A	N/A	470.8	N/A
1946	571.0	551.1	N/A	N/A	572.8	N/A
1947	677.4	665.6	N/A	N/A	688.0	N/A
1948	736.3	739.0	N/A	752.7	761.8	642.2
1949	760.5	742.0	N/A	N/A	765.0	660.1
1950	N/A	866.5	N/A	N/A	886.9	746.6
1951	N/A	954.1	N/A	N/A	973.4	836.5
1952	N/A	994.4	916.0	N/A	1,013.1	873.5
1953	N/A	1,033.1	N/A	N/A	1,050.4	905.5
1954	N/A	1,072.8	N/A	N/A	1,089.8	940.2
1955	N/A	1,155.9	N/A	N/A	1,172.0	1,016.6
1956	N/A	1,256.4	N/A	N/A	1,270.6	1,105.9
1957	N/A	1,352.8	N/A	N/A	1,363.8	1,179.2
1958	N/A	1,414.9	N/A	1,410.0	1,423.0	1,233.6
1959	N/A	N/A	N/A	N/A	N/A	1,307.0

See footnotes at end of table.

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Table 3—Summary: Estimates of domestic net private tangible wealth of the United States, in current prices, selected years, 1900-75—Continued

Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]
			Billion dollars			
1960	N/A	N/A	1,487.0	N/A	N/A	1,361.6
1961	N/A	N/A	N/A	N/A	N/A	1,405.0
1962	N/A	N/A	N/A	N/A	N/A	1,471.2
1963	N/A	N/A	N/A	N/A	N/A	1,551.4
1964	N/A	N/A	N/A	N/A	N/A	1,643.0
1965	N/A	N/A	N/A	N/A	N/A	1,759.5
1966	N/A	N/A	N/A	2,031.9	N/A	1,906.2
1967	N/A	N/A	N/A	N/A	N/A	2,057.8
1968	N/A	N/A	2,410.0	N/A	N/A	2,246.0
1969	N/A	N/A	N/A	N/A	N/A	2,459.0
1970	N/A	N/A	N/A	N/A	N/A	2,651.6
1971	N/A	N/A	N/A	N/A	N/A	2,879.1
1972	N/A	N/A	N/A	N/A	N/A	3,189.8
1973	N/A	N/A	N/A	N/A	N/A	3,575.1
1974	N/A	N/A	N/A	N/A	N/A	4,008.1
1975	N/A	N/A	N/A	N/A	N/A	4,341.0

N/A = Not available.

[1] (*17, 19*). [2] (*20*). [3] (*72*). [4] (*29*). [5] (*21*). [6] (*28*).

estimates or property tax data. No data were found by which to adjust the national totals. The magnitude is probably small relative to totals.

National wealth estimates are not neatly and uniformly constructed. They are built on government collected data, derivations based on government data, independently collected data from inventories and surveys, and data derived from other wealth researchers. Control data are not available for many types of wealth in the national totals.[30] It must be cautioned that the available data are at best only approximate.

One technique that merits special discussion in connection with wealth estimates is the perpetual inventory method (PI). It applies only to reproducible tangible assets such as structures and machinery. Briefly, in using PI, one adds the current capital expenditures for a particular class of assets to the depreciated capital expenditures for previous years, and adjusts them by an appropriate price index to obtain a base-year estimated value in real terms. To get estimated values in current prices, the values are reinflated by the appropriate price indexes (*16*, pp. 10-28). Capital expenditures in any given year are the excess of expenditures on durable goods over depreciation allowances. Depreciation and expected asset life are calculated by reliance on Internal Revenue Service rates where available and on rough approximations otherwise; straight-line depreciation is typically used (*16*). Capital expenditures and depreciation allowances are deflated by appropriate price indexes to base year prices. To obtain current year prices, the depreciated inventories are inflated by the same indexes. The perpetual inventory method was employed by Goldsmith, Kendrick, and Tostlebe in developing the estimates presented here. USDA estimates of wealth in the farm sector use similar methods to value farm machinery and motor vehicles, but not structures, which are calculated as a percentage of total value of farmland and buildings (*65*, pp. 3, 10-13).[31]

There is an arbitrary element in the use of PI for estimating wealth. In order to obtain estimates, assumptions have to be made about such items as expected life and depreciation; the resale market; large disasters, both natural and man made; expected levels of maintenance of machinery; levels of technology embodied in the capital stock; and expansions of facilities. Most of these problems have been amply studied, and the difficulties are well known. Thus, it is recognized that the procedures are arbitrary, and their use may contribute to inaccurate estimates that may be compounded over time. In particular, the resale market, or market for used goods, provides flows between sectors which are not adequately accounted for by PI (*18*).

Many names are associated with perpetual inventory wealth estimates, chief among these are those of Goldsmith and Kendrick. As can be seen from their estimates, there is a certain amount of variation for no readily apparent reason (table 3). Wealth estimates, as indicated earlier, involve many different data sources. Variations can be traced to statistical reasons, refinements of the

[30] National and sectoral totals can vary widely, as can be seen in tables 3 and 4.

[31] For more information on methodology of wealth estimates, see (*16, 18, 20, 25, 32, 65*).

perpetual inventory method, and some to changes in other source data. The estimates of national land value are particularly uncertain. In one study, Goldsmith presents two alternative estimates of land value—a "high" and a "low" one, which differed in the value of residential land—with the understanding the reader could select the one considered most reasonable (*19*).

There also are a number of estimates of the value of wealth in the agricultural sector (table 4). There is considerable variation in the estimates, and it is quite pronounced in the early years. In later years, the discrepancy is smaller though still considerable. The sources of the differences are uncertain. Land accounts for the largest proportion of farm wealth and for this all sources use USDA estimates. Structures are valued differently by the USDA balance sheet and Goldsmith-Kendrick (*62*). The USDA balance sheet figures estimate, on the basis of census data, the proportion structures are of land and structures; they carry the proportion forward between census years. Survey data provide the estimates of value of land and buildings together between census years. Goldsmith and Kendrick use the perpetual inventory method to value structures. Livestock, machinery, automobile, and crop values are derived from USDA data by all users.

Wealth comparisons. Based on the data presented above, the accumulation of wealth in the agricultural sector and for the Nation now may be compared.[32] Values are in current prices. Relative rates of growth in wealth though time for the agricultural sector and the Nation are of interest (table 5).

It is evident that rates of growth of nominal wealth in agriculture and the United States as a whole rarely are equal. For example, in the first decade of this century, the rate of growth of agricultural wealth, at 9.9 percent, was somewhat greater than that for national wealth, at 7.2 percent. In the next decade the wealth of the United States showed a faster rate of growth than that of the agricultural sector. The data are inadequate to show the effect of World War I.

In the 1920's, the rate of accumulation of wealth in agriculture was negative (-2.8 percent). The overall rate of growth for the United States was not large, at 1.7 percent. These years were depression years in agriculture. They were followed by the 1930's, which brought a severe depression to the whole economy. The average annual 1930-39 rate of decrease for U.S. wealth was 1.3 percent; in agriculture, wealth declined on the average 2.7 percent per year during the period 1930-40.

In the early 1940's, agricultural wealth grew faster than did wealth for the economy as a whole, probably because of the Government's wartime policies. During the second half of the decade, the whole economy expanded faster than did the agricultural sector. This was true until the early 1970's when agricul-

[32] The reason for comparing agriculture and the whole economy, rather than agriculture and nonagriculture, is that before 1930 data were available only for selected years; the years selected were not the same for the Nation and its constituent sectors. In order to derive any comparisons on growth of wealth in the early years of the 20th century, it was thus necessary to compare agriculture and the entire economy. Subsequent comparisons in this report, however, are between the agricultural and nonagricultural sectors.

Table 4—Summary: Estimates of net private domestic wealth in agriculture, in current prices, selected years, 1900-75

End of Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]	Tostlebe[7]	Derived from Balance Sheet of Farming Sector[8]
				Billion dollars				
1900	24.3	24.4	N/A	N/A	N/A	N/A	21.8	N/A
1910	N/A	N/A	N/A	N/A	N/A	N/A	43.3	N/A
1912	49.5	49.6	N/A	N/A	N/A	N/A	N/A	N/A
1920	N/A	N/A	N/A	N/A	N/A	N/A	83.8	N/A
1922	69.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A
1925	N/A	N/A	N/A	N/A	N/A	N/A	60.7	N/A
1929	64.3	64.3	N/A	N/A	N/A	N/A	N/A	N/A
1930	N/A	N/A	N/A	N/A	N/A	N/A	60.5	N/A
1931	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1932	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1933	41.0	41.0	N/A	N/A	N/A	N/A	N/A	N/A
1934	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

See footnotes at end of table.

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Table 4—Summary: Estimates of net private domestic wealth in agriculture, in current prices, selected years, 1900-75—Continued

End of Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]	Tostlebe[7]	Derived from Balance Sheet of Farming Sector[8]
				Billion dollars				
1935	N/A	N/A	N/A	N/A	N/A	N/A	40.4	N/A
1936	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1937	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1938	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1939	45.6	45.6	N/A	N/A	N/A	N/A	N/A	48.8
1940	N/A	N/A	N/A	N/A	N/A	N/A	43.9	50.1
1941	N/A	N/A	N/A	N/A	N/A	N/A	N/A	56.8
1942	N/A	N/A	N/A	N/A	N/A	N/A	N/A	65.5
1943	N/A	N/A	N/A	N/A	N/A	N/A	N/A	73.6
1944	N/A	N/A	N/A	N/A	N/A	N/A	N/A	80.7
1945	86.1	86.5	N/A	N/A	86.5	N/A	75.0	87.3
1946	N/A	98.3	N/A	N/A	98.3	N/A	N/A	99.2
1947	N/A	112.0	N/A	N/A	112.0	N/A	N/A	111.0
1948	N/A	118.9	N/A	N/A	118.9	91.6	N/A	118.3
1949	123.8	117.4	N/A	N/A	117.4	N/A	N/A	116.8

See footnotes at end of table.

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Table 4—Summary: Estimates of net private domestic wealth in agriculture, in current prices, selected years, 1900-75—Continued

End of Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]	Tostlebe[7]	Derived from Balance Sheet of Farming Sector[8]
				Billion dollars				
1950	N/A	136.1	N/A	N/A	136.1	N/A	107.4	133.5
1951	N/A	153.0	N/A	N/A	153.0	N/A	N/A	149.0
1952	N/A	150.5	9138.1	N/A	150.5	N/A	N/A	147.4
1953	N/A	144.9	N/A	N/A	144.9	N/A	N/A	144.5
1954	N/A	147.6	N/A	N/A	147.6	N/A	N/A	147.1
1955	N/A	150.4	N/A	N/A	150.4	N/A	N/A	150.9
1956	N/A	158.2	N/A	N/A	158.2	N/A	N/A	158.6
1957	N/A	167.7	N/A	N/A	167.7	131.4	N/A	166.6
1958	N/A	182.4	N/A	N/A	182.4	N/A	N/A	181.6
1959	N/A	N/A	N/A	N/A	N/A	N/A	N/A	184.9
1960	N/A	N/A	9178.8	N/A	N/A	N/A	N/A	186.6
1961	N/A	N/A	N/A	N/A	N/A	N/A	N/A	194.2
1962	N/A	N/A	N/A	N/A	N/A	N/A	N/A	202.4
1963	N/A	N/A	N/A	N/A	N/A	N/A	N/A	209.6
1964	N/A	N/A	N/A	N/A	N/A	N/A	N/A	217.1

See footnotes at end of table.

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Table 4—Summary: Estimates of net private domestic wealth in agriculture, in current prices, selected years, [1]900-75—Continued

End of Year	Goldsmith "Saving"[1]	Goldsmith "Wealth"[2]	Goldsmith "Institutional Investor"[3]	Kendrick "Finance"[4]	Goldsmith "Balance Sheet"[5]	Kendrick "Conference Board"[6]	Tostlebe[7]	Derived from Balance Sheet of Farming Sector[8]
				Billion dollars				
1965	N/A	N/A	N/A	N/A	N/A	N/A	N/A	232.7
1966	N/A	N/A	N/A	N/A	N/A	204.2	N/A	245.5
1967	N/A	N/A	N/A	N/A	N/A	N/A	N/A	258.1
1968	N/A	N/A	[9]266.2	N/A	N/A	N/A	N/A	275.2
1969	N/A	N/A	N/A	N/A	N/A	N/A	N/A	282.4
1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	292.5
1971	N/A	N/A	N/A	N/A	N/A	N/A	N/A	315.4
1972	N/A	N/A	N/A	N/A	N/A	N/A	N/A	356.0
1973	N/A	N/A	N/A	N/A	N/A	345.6	N/A	436.5
1974	N/A	N/A	N/A	N/A	N/A	N/A	N/A	482.5
1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	545.2

N/A = Not available.

Sources: [1](*17*; *19*, table W-27). [2] (*20*, table A-53). [3](*72*, table IB-5). [4](*29*). [5](*21*, tables I and Ia). [6](*28*). [7](*51*). [8](*62*, entries are adjusted to be current as of December 31 of the previous year.)

Footnote: [9]Estimates are only for "farm business." Household assets are excluded.

Table 5—Nominal average annual rates of growth in wealth, agricultural sector and U.S. economy, selected time periods, 1900-75

Year	Agriculture	Year	U.S.
	Percent		*Percent*
1900-10	9.9	1900-09	7.2
1910-20	9.4	1910-19	16.4
1920-30	-2.8	1920-29	1.7
1930-40	-2.7	1930-39	-1.3
1940-45	14.9	1940-45	7.3
1946-49	5.9	1946-49	11.1
1950-59	4.3	1950-59	8.3
1960-69	5.7	1960-69	9.0
1970-75	17.3	1970-75	12.7
1900-75	32.0	1900-75	71.0

Sources: Column (2): Table 4, 1900-40 Tostlebe, 1940-present "Balance Sheet." Column (4): Table 3, Goldsmith "Saving" and Kendrick "Conference Board."

tural wealth grew more rapidly than U.S. wealth as a whole.[33] Throughout the 1900-75 period, wealth in the agricultural sector increased 32.0 percent compared with a 71.0 percent increase for the economy as a whole.

The importance of these changes is that variations in wealth held by the different sectors of the economy will account in part for changes in taxes assessed against that wealth. Other factors, such as legal changes in tax rates, assessment practices, assessment ratios, and property subject to the tax, would account for the rest.

Tax and wealth comparisons. Taxes on farm property as a percentage of the total U.S. tax bill may now be compared with farm wealth as a percentage of U.S. wealth (table 6).[34] The tax and wealth data are not available for the same years during the period 1901-34, but it is evident from what data are available that the farm tax percentages of U.S. property taxes are significantly less than the farm wealth percentages are of U.S. wealth. In 1935, the difference was 3.4 percentage points.

During the period 1910-40, the farm wealth percentage showed a decline from 31.4 percent to a range of 12.8 to 14.6 percent. The farm tax percent, on the other hand, rose slightly from 1926 to 1931 before exhibiting a decline by 1933. During the rest of the decade it was quite stable.

The farm wealth percentage showed an increase during the first half of the 1940's, while the tax percentage exhibited a slight increase. Then, during the second half of the decade, the wealth percentage fell while the tax percentage

[33] If some of the rates seem inordinately high, it is in part because the rates of growth are in nominal, not real terms. Relative price inflation or deflation thus will account for part of the rate of change.

[34] Taxes are based on assessment years in table 6 rather than on collection years, as was the case in table 1.

Table 6—Farm property taxes and wealth as a percentage of all property taxes and wealth, United States, selected assessment years, 1901-75

End of assessment Year	Property taxes			Wealth							
				U.S. net private domestic wealth		Agricultural wealth		Agriculture/U.S.			
	U.S. total[1]	Agriculture[1]	Agriculture/ U.S.[1]	Goldsmith "Saving"[2]	Kendrick "Conference Board"[2]	Tostlebe[3]	Balance Sheet[3]	Tostlebe/ Goldsmith	Tostlebe/ Kendrick	Balance Sheet/ Goldsmith	Balance Sheet/ Kendrick
	Billion dollars		Percent	Billion dollars				Percent			
1901	0.7	N/A	N/A	83.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1910	N/A	N/A	N/A	137.8	N/A	43.3	N/A	31.4	N/A	N/A	N/A
1912	1.3	N/A	N/A	149.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1920	N/A	N/A	N/A	342.0	N/A	83.8	N/A	24.5	N/A	N/A	N/A
1921	3.3	N/A	N/A/	297.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1925	N/A	N/A	N/A	346.3	N/A	60.7	N/A	17.5	N/A	N/A	N/A
1926	4.7	0.6	12.7	359.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1930	N/A	N/A	N/A	365.9	N/A	60.5	N/A	16.5	N/A	N/A	N/A
1931	4.5	0.6	13.1	317.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1932	N/A	N/A	N/A	280.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1933	4.1	0.4	10.7	283.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1934	N/A	N/A	N/A	289.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1935	4.1	0.4	10.6	288.5	N/A	40.4	N/A	14.0	N/A	N/A	N/A
1936	N/A	N/A	N/A	306.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1937	4.4	0.5	10.2	319.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1938	N/A	N/A	N/A	317.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1939	4.4	0.5	10.3	323.8	N/A	N/A	48.8	N/A	N/A	15.1	N/A
1940	N/A	N/A	N/A	344.2	N/A	43.9	50.1	12.8	N/A	14.6	N/A
1941	4.5	0.5	10.2	385.5	N/A	N/A	56.8	N/A	N/A	14.7	N/A
1942	N/A	N/A	N/A	409.7	N/A	N/A	65.5	N/A	N/A	16.0	N/A
1943	4.6	0.5	10.4	425.5	N/A	N/A	73.6	N/A	N/A	17.3	N/A
1944	4.8	N/A	N/A	440.9	N/A	N/A	80.7	N/A	N/A	18.3	N/A
1945	5.0	0.5	11.2	470.3	N/A	75.0	87.3	16.0	N/A	18.6	N/A
1946	5.5	0.6	11.2	571.0	N/A	N/A	99.2	N/A	N/A	17.4	N/A
1947	6.1	0.7	12.0	677.4	N/A	N/A	111.0	N/A	N/A	16.4	N/A
1948	6.8	0.8	11.8	736.3	642.2	N/A	118.3	N/A	N/A	16.1	18.4
1949	7.3	0.9	11.9	760.5	660.7	N/A	116.8	N/A	N/A	15.4	17.7
1950	7.9	0.9	11.6	N/A	746.6	107.4	133.5	N/A	14.4	N/A	17.9
1951	8.7	1.0	11.4	N/A	836.5	N/A	149.0	N/A	N/A	N/A	17.8
1952	9.4	1.0	11.1	N/A	873.5	N/A	147.4	N/A	N/A	N/A	16.9
1953	10.0	1.1	10.7	N/A	905.5	N/A	144.5	N/A	N/A	N/A	16.0

See footnotes at end of table.

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Table 6—Farm property taxes and wealth as a percentage of all property taxes and wealth, United States, selected assessment years, 1901-75—Continued

End of assessment years	Property taxes			Wealth						
				U.S. net private domestic wealth		Agricultural wealth		Agriculture/U.S.			
	U.S. total[1]	Agriculture[1]	Agriculture/ U.S.[1]	Goldsmith "Saving"[2]	Kendrick "Conference Board"[2]	Tostlebe[3]	Balance Sheet[3]	Tostlebe/ Goldsmith	Tostlebe/ Kendrick	Balance Sheet/ Goldsmith	Balance Sheet/ Kendrick
	Billion dollars		*Percent*	*Billion dollars*				*Percent*			
1954	10.7	1.1	10.2	N/A	940.2	N/A	147.1	N/A	N/A	N/A	15.7
1955	11.7	1.2	9.8	N/A	1,016.6	N/A	150.9	N/A	N/A	N/A	14.8
1956	12.9	1.2	9.3	N/A	1,105.9	N/A	158.6	N/A	N/A	N/A	14.3
1957	14.0	1.3	9.0	N/A	1,179.2	N/A	166.6	N/A	N/A	N/A	14.1
1958	15.0	1.3	8.9	N/A	1,233.6	N/A	181.6	N/A	N/A	N/A	14.7
1959	16.4	1.4	8.7	N/A	1,307.0	N/A	184.9	N/A	N/A	N/A	14.2
1960	18.0	1.5	8.5	N/A	1,361.6	N/A	186.6	N/A	N/A	N/A	13.7
1961	19.1	1.6	8.4	N/A	1,405.0	N/A	194.2	N/A	N/A	N/A	13.8
1962	19.8	1.7	8.5	N/A	1,471.2	N/A	202.4	N/A	N/A	N/A	13.8
1963	21.2	1.7	8.2	N/A	1,551.4	N/A	209.6	N/A	N/A	N/A	13.5
1964	22.6	1.8	8.0	N/A	1,643.0	N/A	217.1	N/A	N/A	N/A	13.2
1965	24.7	1.9	7.6	N/A	1,759.5	N/A	232.7	N/A	N/A	N/A	13.2
1966	26.0	2.0	7.7	N/A	1,906.2	N/A	245.5	N/A	N/A	N/A	12.9
1967	27.7	2.1	7.6	N/A	2,057.8	N/A	258.1	N/A	N/A	N/A	12.5
1968	30.7	2.3	7.4	N/A	2,246.0	N/A	275.2	N/A	N/A	N/A	12.3
1969	34.1	2.4	7.1	N/A	2,459.0	N/A	282.4	N/A	N/A	N/A	11.5
1970	37.9	2.6	6.8	N/A	2,651.6	N/A	292.5	N/A	N/A	N/A	11.0
1971	42.1	2.8	6.6	N/A	2,879.1	N/A	315.4	N/A	N/A	N/A	11.0
1972	45.3	2.9	6.4	N/A	3,189.8	N/A	356.0	N/A	N/A	N/A	11.2
1973	47.7	2.9	6.2	N/A	3,575.1	N/A	436.5	N/A	N/A	N/A	12.2
1974	51.5	3.1	6.0	N/A	4,008.1	N/A	482.5	N/A	N/A	N/A	12.0
1975	N/A	N/A	N/A	N/A	4,341.0	N/A	545.2	N/A	N/A	N/A	12.6

N/A = Not available.

Sources: [1] Table 1. Taxes have been adjusted backward 1 year to correspond to assessment years. Percentages calculated before rounding based on data shown in table 1. [2] Table 3. [3] Table 4.

increased slightly. As of 1975, this pattern of a slowly declining agricultural wealth percentage was continuing, with two exceptions: In 1958, a year of business recession, the farm wealth percentage rose; it rose again beginning in 1972 (a very good year for farm income) and this rise persisted at an uneven pace through 1975 due to rapidly increasing land values. The farm tax percentage peaked in 1947, and has exhibited a steady decline since.

Some explanations of these trends may be hazarded at this point. With regard to wealth, it may be obvious that sectoral wealth percentages seem to be related to: (1) the Government's allocational policies in wartime, (2) business cycles, and (3) relative rates of gorwth in sectoral income. Overall the trend in the tax percentages does not appear to be as responsive to these factors as is the case for its tax base—wealth. However, it does appear to be somewhat responsive to the business cycle.

Ratio of property taxes to wealth. The growth of wealth has expanded the potential property tax base. The degree to which this potential tax base is related to taxes paid is measured by the ratio (property taxes paid)/(wealth). This ratio can also be identified as the effective property tax rate.[35] The differential pattern of growth of wealth by sector has had different effects on the tax-wealth ratio (or the effective tax rate) in the agricultural and nonagricultural sectors (table 7).

Only sketchy data are available for both sectors before 1945. In 1935, the agricultural ratio was .010; the nonagricultural ratio was .015. By 1939, the agricultural ratio was unchanged, but in the nonagricultural sector it had declined to .014. By 1945, the ratios differed by between .004 and .006, depending on the wealth estimates used.

After 1945, the agricultural ratio has been consistently lower than the nonagricultural ratio. The size of the difference varied between years, and the data do not provide unique estimates of the difference in a given year. The range of the differences varies from .002 in 1949 (estimate based on Goldsmith saving and balance sheet) to .007 in 1961, 1963, 1964, 1965, 1966, 1972, and 1973. The ratios, then, came closest together in 1949 and then diverged.

It is interesting to look at the trends of the ratios over time. It is regrettable that the data are not more complete for the 1920's and 1930's. The agricultural ratio was .010 in both 1935 and 1939, but it may have fluctuated between those years. The ratio continued to decline through the 1940's until it leveled off at .007 in 1948 and .008 in 1949. It stayed at .008 or .007 until 1969 when it increased to .009. It remained at .009 through 1971 and declined to .006 by 1974.

The nonagricultural sector's ratio is not as well behaved as the agricultural ratio, and there are more numerous estimates of the ratio. This ratio reached a peak of .015 in 1935, then began a decline that reached .011 in 1950-51. The

[35] The concept of the effective tax rate differs from the local tax rate or millage rate by abstracting from assessment ratios and tax exemptions, which differ from jurisdiction to jurisdiction. Effective tax rates are usually based on "market values" of wealth, which the wealth measure used here approximates.

Table 7—Ratio of property taxes to wealth agricultural and nonagricultural sectors, United States, selected assessment years, 1900-75

End of assessment year	Agricultural sector					Nonagricultural sector								
	Wealth[1]			Ratio of taxes to wealth		Wealth[1]					Ratio of taxes to wealth			
						Goldsmith "Saving"		Kendrick "Conference Board"			Goldsmith "Saving"		Kendrick "Conference Board"	
	Tostlebe	Balance Sheet	Property taxes[2]	Tostlebe	Balance Sheet	Tostlebe	Balance Sheet	Tostlebe	Balance Sheet	Property taxes[2]	Tostlebe	Balance Sheet	Tostlebe	Balance Sheet
	Billion dollars					*Billion dollars*								
1900	21.8	N/A	N/A	N/A	N/A	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1910	43.3	N/A	N/A	N/A	N/A	94.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1920	83.8	N/A	N/A	N/A	N/A	258.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1925	60.7	N/A	N/A	N/A	N/A	285.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1926	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	4.1	N/A	N/A	N/A	N/A
1930	60.5	N/A	N/A	N/A	N/A	305.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1931	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	3.9	N/A	N/A	N/A	N/A
1932	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1933	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	3.7	N/A	N/A	N/A	N/A
1934	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1935	40.4	N/A	0.4	.010	N/A	248.3	N/A	N/A	N/A	3.7	.015	N/A	N/A	N/A
1936	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1937	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	3.9	N/A	N/A	N/A	N/A
1938	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1939	N/A	48.8	0.5	N/A	.010	N/A	275.0	N/A	N/A	3.9	N/A	.014	N/A	N/A
1940	43.9	50.1	N/A	N/A	N/A	300.3	294.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1941	N/A	56.8	0.5	N/A	.009	N/A	328.7	N/A	N/A	4.0	N/A	.012	N/A	N/A
1942	N/A	65.5	N/A	N/A	N/A	N/A	344.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1943	N/A	73.6	0.5	N/A	.007	N/A	351.9	N/A	N/A	4.1	N/A	.012	N/A	N/A
1944	N/A	80.7	N/A	N/A	N/A	N/A	360.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

See footnotes at end of table.

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Table 7--Ratio of property taxes to wealth, agricultural and nonagricultural sectors, United States, selected assessment years, 1900-75--Continued

End of assessment year	Agricultural sector					Nonagricultural sector								
	Wealth[1]			Ratio of taxes to wealth		Wealth[1]					Ratio of taxes to wealth			
						Goldsmith "Saving"		Kendrick "Conference Board"			Goldsmith "Saving"		Kendrick "Conference Board"	
	Taxable	Balance Sheet	Property taxes[2]	Taxable	Balance Sheet	Taxable	Balance Sheet	Taxable	Balance Sheet	Property taxes[2]	Taxable	Balance Sheet	Taxable	Balance Sheet
	Billion dollars					Billion dollars								
1945	75.0	87.3	0.5	.007	.006	395.3	383.0	N/A	N/A	4.5	.011	.012	N/A	N/A
1946	N/A	99.2	0.6	N/A	.006	N/A	471.8	N/A	N/A	4.9	N/A	.010	N/A	N/A
1947	N/A	111.0	0.7	N/A	.006	N/A	566.4	N/A	N/A	5.4	N/A	.010	N/A	N/A
1948	N/A	118.3	0.8	N/A	.007	N/A	618.0	N/A	523.9	6.0	N/A	.010	N/A	.012
1949	N/A	116.8	0.9	N/A	.008	N/A	643.7	N/A	543.9	6.4	N/A	.010	N/A	.012
1950	107.4	133.5	0.9	.008	.007	N/A	N/A	639.2	613.1	7.0	N/A	N/A	.011	.011
1951	N/A	149.0	1.0	N/A	.007	N/A	N/A	N/A	687.5	7.7	N/A	N/A	N/A	.011
1952	N/A	147.4	1.0	N/A	.007	N/A	N/A	N/A	726.1	8.4	N/A	N/A	N/A	.012
1953	N/A	144.5	1.1	N/A	.008	N/A	N/A	N/A	761.0	8.9	N/A	N/A	N/A	.012
1954	N/A	147.1	1.1	N/A	.008	N/A	N/A	N/A	795.1	9.6	N/A	N/A	N/A	.012
1955	N/A	150.9	1.2	N/A	.008	N/A	N/A	N/A	865.7	10.5	N/A	N/A	N/A	.012
1956	N/A	158.6	1.2	N/A	.008	N/A	N/A	N/A	947.3	11.7	N/A	N/A	N/A	.012
1957	N/A	166.6	1.3	N/A	.008	N/A	N/A	N/A	1,012.6	12.7	N/A	N/A	N/A	.013
1958	N/A	181.0	1.3	N/A	.007	N/A	N/A	N/A	1,052.0	13.7	N/A	N/A	N/A	.013
1959	N/A	194.9	1.4	N/A	.008	N/A	N/A	N/A	1,122.1	15.0	N/A	N/A	N/A	.013
1960	N/A	186.6	1.5	N/A	.008	N/A	N/A	N/A	1,175.0	16.5	N/A	N/A	N/A	.014
1961	N/A	194.2	1.6	N/A	.008	N/A	N/A	N/A	1,210.8	17.5	N/A	N/A	N/A	.015
1962	N/A	202.4	1.7	N/A	.008	N/A	N/A	N/A	1,268.8	18.1	N/A	N/A	N/A	.014
1963	N/A	209.6	1.7	N/A	.008	N/A	N/A	N/A	1,341.8	19.5	N/A	N/A	N/A	.015
1964	N/A	217.1	1.8	N/A	.008	N/A	N/A	N/A	1,425.9	20.8	N/A	N/A	N/A	.015

See footnotes at end of table.

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Table 7—Ratio of property taxes to wealth, agricultural and nonagricultural sectors, United States, selected assessment years, 1900-75

End of assessments year	Agricultural sector: Wealth[1] Tostlebe	Agricultural sector: Wealth[1] Balance Sheet	Agricultural sector: Property taxes[2]	Agricultural sector: Ratio of taxes to wealth Tostlebe	Agricultural sector: Ratio of taxes to wealth Balance Sheet	Nonagricultural sector: Wealth[3] Goldsmith "Saving" Tostlebe	Goldsmith "Saving" Balance Sheet	Kendrick "Conference Board" Tostlebe	Kendrick "Conference Board" Balance Sheet	Nonagricultural sector: Property taxes[2]	Nonagricultural sector: Ratio of taxes to wealth Goldsmith "Saving" Tostlebe	Goldsmith "Saving" Balance Sheet	Kendrick "Conference Board" Tostlebe	Kendrick "Conference Board" Balance Sheet
	Billion dollars					*Billion dollars*								
1965	N/A	232.7	1.9	N/A	.008	N/A	N/A	N/A	1,526.8	22.8	N/A	N/A	N/A	.015
1966	N/A	245.5	2.0	N/A	.008	N/A	N/A	N/A	1,660.7	24.0	N/A	N/A	N/A	.015
1967	N/A	258.1	2.1	N/A	.008	N/A	N/A	N/A	1,799.7	25.6	N/A	N/A	N/A	.014
1968	N/A	275.2	2.3	N/A	.008	N/A	N/A	N/A	1,970.8	28.4	N/A	N/A	N/A	.014
1969	N/A	282.4	2.4	N/A	.009	N/A	N/A	N/A	2,176.6	31.7	N/A	N/A	N/A	.015
1970	N/A	292.5	2.6	N/A	.009	N/A	N/A	N/A	2,359.1	35.3	N/A	N/A	N/A	.015
1971	N/A	315.4	2.8	N/A	.009	N/A	N/A	N/A	2,563.7	39.3	N/A	N/A	N/A	.015
1972	N/A	336.0	2.9	N/A	.008	N/A	N/A	N/A	2,833.8	42.4	N/A	N/A	N/A	.015
1973	N/A	436.5	2.9	N/A	.007	N/A	N/A	N/A	3,138.6	44.8	N/A	N/A	N/A	.014
1974	N/A	482.9	3.1	N/A	.006	N/A	N/A	N/A	3,525.6	48.4	N/A	N/A	N/A	.014
1975	N/A	545.2	N/A	N/A	N/A	N/A	N/A	N/A	3,795.8	N/A	N/A	N/A	N/A	N/A

N/A = Not available.

Sources: [1] Table 4. [2] Table 1. Taxes have been adjusted backward one year to correspond with assessment years. [3] Tables 3 and 4. First level of this column heading identifies the source of the national wealth estimates (table 3). Second level identifies the agricultural data source (table 4). The first level minus the second level yields the various wealth estimates for the nonagricultural sector.

trend is not clear in the late 1940's, because the series is spliced and the data differ by .002. In 1952, the ratio rose to .012. It increased again in 1957, and apparently was not affected by the 1958 recession (unlike the agricultural ratio). In 1960, it rose again, and for the rest of the time period up to 1974 it fluctuated between .014 and .015.

It is important to consider the role of tax-exempt property in the nonagricultural sector. In the nonagricultural sector this includes most of the nonprofit sector: private educational institutions, foundations, and churches. Historically, these institutions have been exempt from property taxation under various State laws. Over time, a growing number of States have added more kinds of institutions to the tax-exempt list.

There also is property that is wholly or partially exempt in agriculture, but it is unlikely that its relative importance approaches that of the nonprofit institutions in the nonagricultural sector. However, the situation for the agricultural sector could be changed as more States adopt differential assessment laws and exempt farm personal property from taxation. Excluding the nonprofit sector from the nonagricultural sector would cause the tax/wealth ratio to rise, unless the sector is so small as to cause no measurable change. It also would tend to cause the ratios of property taxes to wealth to widen between the agricultural and nonagricultural sectors, other things being equal.

Very little information exists on the role of the nonprofit institutions in the nonagricultural sector (*19, 72*). Available data are summarized in table 8. It should be noted that the "nonprofit sector" includes data only for selected institutions. No information is available on what percentage this estimated nonprofit sector is of the actual nonprofit sector.

Controlling for the presence of a nonprofit sector in the nonagricultural sector obviously would not alter the result that the agricultural sector pays less taxes in proportion to its wealth than does the nonagricultural sector. What is surprising is that the gap noted above did not widen significantly between the two sectors. In 1933, the nonagricultural "profit" ratio was .016, while the agricultural ratio was .010. In 1968, the ratios were .014 for the nonagricultural profit sector and .008 for agriculture. The range of differences in ratios between the two sectors varied between .002 (1949, one estimate) and .006 (1933 and 1968).

Analysis of the data over time reveals that the nonagricultural profit sector's ratio declined between 1933 and 1949, and then rose between 1949 and 1968. The agricultural sector's ratio rose between 1933 and 1939, declined by 1945, and then rose slowly until 1968. These data parallel those presented above in table 7. In short, until recent years, the relative size of the nonprofit sector has been so small that it has not had much influence on the resultant tax/wealth ratios when netted out.

Thus, controlling for the presence of a tax exempt sector does not alter the situation much. The agricultural tax/wealth ratio is still consistently lower than the nonagricultural ratio and a comparison of the results shown in tables 7 and 8, shows that the exclusion of the nonprofit sector in the nonagricultural

Table 9—Ratio of property taxes to wealth, agricultural sector and nonagricultural "profit" sector, United States, selected assessment years, 1900-68

End of assessment year	Wealth[1]						Property taxes[2]		Ratio of property taxes to wealth			
	Agricultural sector		Selected nonagricultural nonprofit institutions		Nonagricultural "profit" sector				Nonprofit nonagricultural sector		Agricultural sector	
	Goldsmith "Saving"[3]	Balance Sheet[3]	Goldsmith "Saving"[4]	Goldsmith "Institutional Investor"[4]	Goldsmith "Saving"	Goldsmith "Institutional Investor"	Agricultural sector	Nonagricultural sector	Goldsmith "Saving"	Goldsmith "Institutional Investor"	Goldsmith "Saving"	Balance Sheet
	Billion dollars											
1900	24.3	N/A	1.5	N/A	54.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1912	49.5	N/A	2.7	N/A	97.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1922	69.4	N/A	5.2	N/A	227.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1929	64.3	N/A	7.3	N/A	326.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1933	41.0	N/A	6.2	N/A	236.6	N/A	0.4	3.7	.016	N/A	.010	N/A
1939	45.6	48.8	6.9	N/A	271.3	N/A	0.5	3.9	.014	N/A	.011	.010
1945	86.1	87.3	8.1	N/A	376.1	N/A	0.5	4.5	.012	N/A	.006	.006
1949	123.8	116.8	12.8	N/A	623.9	N/A	0.9	6.4	.010	N/A	.007	.008
1953	N/A	147.4	N/A	23.0	N/A	745.6	1.0	8.4	N/A	.011	N/A	.007
1960	N/A	186.6	N/A	44.7	N/A	1,255.7	1.5	16.5	N/A	.013	N/A	.008
1968	N/A	275.2	N/A	87.6	N/A	2,047.2	2.3	28.4	N/A	.014	N/A	.008

N/A = Not available.

[1] Total wealth is the sum of the wealth of the agricultural sector, selected nonagricultural nonprofit institutions, and the nonagricultural "profit" sector. [2] Table 1. Data were adjusted backward 1 year to correspond with assessment years. [3] Table 4. [4] (*17*, table W-25; *19*). [5] (*72*, table 10-3).

sector does not materially alter the range of differences in ratios between the two sectors.

What are some of the probable causes of the difference in effective tax rates between the two sectors? First, although assessment ratios are set by law, effective assessment ratios could differ systematically between rural and urban areas. Some reasons for this are: (1) some States with classified property tax systems assess farm property at lower rates than other property; (2) rural farmland does not "turn over" as rapidly in the market as does urban real property, so it is more difficult for assessors to gauge rising market values in rural areas; (3) assessment quality may vary between rural and urban areas; (4) State laws permitting differential assessment of farmland and exemption of certain classes of farm personal property are becoming more important over time and would in most cases effectively lower the assessment ratio for farm wealth.

Second, the existence of overlapping jurisdictions, such as some combination of municipal governments, school districts, township governments, county governments, special districts, and State governments, taxing the same tax base, will cause the aggregate value of all levies to vary from jurisdiction to jurisdiction. It is unlikely many farms pay municipal taxes; therefore, owners of nonagricultural property would probably have to pay taxes to at least one more jurisdiction than farm owners typically would.

Thirdly, the quality or quantity of public services may simply be lower in rural than in urban areas. The property taxes necessary to finance those services would thus be lower.

Assessed value of farm and nonfarm property. A preliminary evaluation of some of the possible causes of the differences in effective tax rates could be developed by determining what percentage of total property wealth assessed values of property account for, by sectors. This percentage would measure to what extent agricultural property constitutes the total property tax base. There are problems in this approach. Methods for obtaining assessed values vary between States with regard to the following items, which can be loosely classified as a definitional, aggregation, and data problems.

First, consider the role of totally exempt property. Most States do not assess the value of totally exempt property. Theoretically, at least, this property is counted as gross wealth and as such should constitute part of the property tax base. This is a definitional problem. Also, the kinds of institutions exempted are determined by law and vary from State to State. This is a problem of aggregating unlike quantities. As mentioned above, most States do not keep data on values of total exemptions so information is not available to correct the raw data; this is a data problem.

Second, there is the role of partial exemptions. These are set by law to be a fixed value, a proportion of household income, or some other figure. The partial exemption may be applicable only for specified purposes, such as school districts. A value can usually be determined for partial exemptions by subtracting net assessed value from gross assessed valuation, numbers which most States collect. Since these vary between States, the problem is one of aggregating dissimilar quantities.

Lastly, there are differences in assessment ratios. These also vary from State to State, making a problem, again, one of adding unlike quantities. In addition to these problems, there is difficulty in obtaining comprehensive data on assessed valuations. The Census of Governments provides data on gross assessed valuations of locally assessed taxable real property only for selected local areas (*56*). More complete data are available for locally assessed personal property, but this excludes the value of property assessed by States. As for the farmland component of the property tax base, the Bureau of the Census counts farmland in the category "acreage" which also includes timber land and vacant land. So data on farmland can be only imprecise. Because of these definitional, data, and aggregational problems, it was not possible to determine how much the farm sector provides of the total tax base.[36]

INTERNAL AGRICULTURAL SECTOR CHANGES

The focus now changes to factors within the agricultural sector. The technological revolution on farms and the accompanying outmigration of people from the agricultural sector of the United States has been well documented. In this section, the purpose is to relate some of the internal sectoral variables that have shown great change to the property tax as this tax pertains to the agricultural sector. This is done in a historical context in an attempt to gain more understanding of the degree to which the role of farm property taxation has changed through time. Data limitations confine most of the analysis to this century.

Number of Farms

The changing number of farms has implications for the property tax. The number of farms declined from 5.86 million in 1902 to 2.43 million in 1975—a 58.5 percent drop—following the well-known trend (table 9). The farm real estate tax payment averaged only $19.17 per farm in 1902. Declining farm numbers combined with a steady rise in taxes increased this figure 60 times to $1,174.77 per farm in 1975. The farm real estate tax accounted for the bulk of farm property taxes throughout this period, ranging from a high of 90.5 percent in 1934 to a low of 78.0 percent in 1952 (table 9). (Data are not available for years prior to 1927.) Although these data are interesting in them-

[36] Nevertheless, the Bureau of the Census (*61*) has derived a U.S. total for gross and net assessed valuation of property for 1973 and 1975. The figures are as follows:

Item	Amount	
	1973	1975
	Billion dollars	
Assessed value, gross total	872.6	1,096.3
Amount exempt	27.6	33.4
Assessed value, net total	845.0	1,062.9

Table 9—Farm property taxes per farm, per acre, and per farm person, United States, selected years, 1902-75[1]

Year	Number of farms	Farm real estate tax per farm	Farm real estate tax/ Total farm property tax	Taxable farmland[2]	Farm real estate tax per acre	Farm population	Farm property tax per farm person
	Million	*Dollars*	*Percent*	*Million acres*	*Dollars*	*Million*	*Dollars*
1902	5.86	19.17	N/A	828	.14	N/A	N/A
1913	6.39	34.06	N/A	903	.24	32.3	N/A
1922	6.42	79.55	N/A	942	.54	32.1	N/A
1927	6.34	86.46	87 9	950	.57	30.5	20.31
1932	6.50	70.95	90.4	1,014	.45	31.4	16.25
1934	6.71	57.28	90.5	1,041	.37	32.3	13.13
1936	6.67	58.87	89.6	1,050	.38	31.7	13.88
1938	6.38	62.56	89.3	1,042	.38	31.0	14.47
1940	6.10	65.75	88.9	1,034	.39	30.5	14.80
1942	6.00	66.58	85.7	1,042	.38	28.9	16.12
1944	5.91	71.00	83.9	1,051	.40	24.8	20.13
1945	5.86	78.78	83.6	1,055	.44	24.4	22.80
1946	5.76	89.43	84.0	1,058	.49	25.4	24.30
1947	5.67	106.21	82.6	1,060	.57	25.8	28.41
1948	5.57	117.14	81.4	1,063	.62	24.4	33.04
1949	5.48	128.40	80.9	1,066	.66	24.2	36.06
1950	5.38	137.48	80.8	1,070	.69	23.0	39.97
1951	5.23	149.37	78.8	1,071	.73	21.9	45.00
1952	5.08	158.90	78.0	1,071	.76	21.7	47.88
1953	4.93	172.84	79.3	1,072	.79	19.9	53.68
1954	4.78	183.00	80.3	1,073	.82	19.0	57.60
1955	4.57	202.43	80.7	1,063	.88	19.1	60.43
1956	4.35	221.41	81.6	1,053	.92	18.7	63.83

ee footnotes at end of table.

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Table 9—Farm property taxes per farm, per acre, and per farm person, United States, selected years, 1902-75[1] —Continued

Year	Number of farms	Farm real estate tax per farm	Farm real estate tax/ Total farm property tax	Taxable farmland[2]	Farm real estate tax per acre	Farm population	Farm property tax per farm person
	Million	*Dollars*	*Percent*	*Million acres*	*Dollars*	*Million*	*Dollars*
1957	4.13	251.73	81.9	1,044	.99	17.7	71.20
1958	3.92	277.10	81.3	1,033	1.05	17.1	77.70
1959	3.70	311.74	80.8	1,025	1.13	16.6	86.07
1960	3.60	345.31	81.3	1,024	1.21	15.6	98.03
1961	3.49	375.75	81.5	1,020	1.28	14.8	108.68
1962	3.38	406.10	81.9	1,017	1.35	14.3	117.22
1963	3.27	433.66	81.6	1,014	1.40	13.4	129.66
1964	3.16	464.44	81.6	1,011	1.45	13.0	138.31
1965	3.09	497.47	81.9	1,001	1.53	12.4	151.16
1966	3.02	541.89	81.6	992	1.65	11.6	172.52
1967	2.94	587.81	81.8	983	1.76	10.9	194.13
1968	2.87	654.99	82.4	974	1.93	10.5	217.58
1969	2.80	727.62	84.0	965	2.11	10.3	235.64
1970	2.73	794.54	84.3	956	2.27	9.7	265.14
1971	2.66	892.93	85.3	990	2.40	9.4	296.22
1972	2.59	950.85	85.3	986	2.50	9.6	300.79
1973	2.52	997.50	85.7	982	2.56	9.5	308.82
1974	2.45	1,082.37	85.7	980	2.70	9.3	332.91
1975	[3]2.43	[3]1,174.77	[3]84.9	979	2.92	8.9	[3]377.90

N/A = Not available.

[1] Includes Alaska and Hawaii beginning with 1960. [2] Unpublished data from the farm real estate tax series (*6*). Based on data from the Census of Agriculture for the 1902-70 period and from the Statistical Reporting Service thereafter. [3] Preliminary.

Sources: (*6, 7, 12, 48, 54, 57, 68,*).

selves, they do not carry the significance of a comparison of property taxes with production expenses or income, which is done below.

Taxable Farmland

According to the Census of Agriculture, the total land in farms increased from 841.2 million acres in 1900 to 1,021 million acres at the time of the latest census in 1974, an increase of 21.4 percent (*52, 54*). This reflects the addition of four new States to the Union during this span plus the addition of farmland in the remaining States. Taxable farmland increased from 828 million acres in 1902 to 980 million acres in the agricultural census year of 1974 for an increase of 18.4 percent (table 9). Taxable farmland peaked at 1,073 million acres in 1954. The slower rate of growth of the taxable farmland series and resultant divergence between this series and total land in farms reflects the better accounting of public and Indian lands in the Census of Agriculture beginning in the 1930's. In 1975, taxable farmland was estimated to be only 90.1 percent of all land in farms. This represents the largest percentage gap observed to date between these two historical series.

Taxes per acre have increased from $0.14 per acre in 1902 to $2.92 per acre in 1975 or 20 times (table 9). Although of interest, taxes per acre figures are not as important as taxes per $100 of value or taxes compared to farm income. Both of these concepts are explored below.

Farm Population

The U.S. farm population declined from 32.3 million in 1913 to 8.9 million in 1975 for a loss of 72.5 percent during the period. This well-documented loss, coupled with rising taxes, caused from property taxes to climb from $20.31 per farm person in 1927 to $377.90 per farm person in 1975 (table 9). This eighteenfold increase, as in the number-of-farms case, is interesting, but not nearly as important as a comparison of taxes with production costs and income—which will be presented below.

Value of Farmland and Buildings

The value of farmland and buildings (VLAB) in private ownership increased 17 times (from $20.3 billion to $367.4 billion) between 1902 and 1975 (table 10). However, the farm real estate tax per $100 of VLAB was relatively stable throughout the period (table 10). It was $0.55 per $100 of VLAB in 1913, increased to a peak of $1.52 in 1932 (the Great Depression), decreased to $0.77 in 1945-46, and after a steady climb to $1.00 in 1950 remained quite stable until the 1970's when a decline began.

The rapid consolidation of farms and outmigration of farm people has led to a decreased need for farmsteads. But there is the remaining question of whether the residual farmsteads are relatively more valuable, thus compensating for those lost? This has not been the case, however. Farm building values

Table 10—Value of farmland and buildings, and farm real estate taxes per $100 of full value, United States, selected years, 1902-75[1]

Year	Value of farmland and buildings in private ownership[2]	Farm real estate taxes per $100 of full value	Farm building value/ Farm real estate value	Value of farm real estate/ Value of all farm assets
	Billion dollars	*Dollars*	*Percent*	*Percent*
1902	20.3	N/A	N/A	N/A
1913	39.4	.55	N/A	N/A
1922	52.9	.96	N/A	N/A
1927	47.4	1.16	N/A	N/A
1932	37.6	1.52	29.7	N/A
1934	33.0	1.17	31.3	N/A
1936	35.4	1.11	32.4	N/A
1938	34.2	1.17	31.4	N/A
1940	34.1	1.18	29.4	63.5
1942	41.2	.97	29.0	59.6
1944	53.1	.79	29.2	57.0
1945	60.5	.77	27.8	57.2
1946	67.8	.77	27.9	58.9
1947	72.9	.83	27.9	58.8
1948	75.8	.87	28.4	57.6
1949	74.4	.95	28.6	56.8
1950	74.5	1.00	29.3	56.8
1951	85.7	.91	28.7	57.2
1952	94.1	.86	28.4	56.9
1953	95.5	.89	27.8	58.7
1954	94.0	.93	28.4	58.9
1955	97.1	.96	27.6	59.5
1956	101.6	.96	26.2	60.7
1957	108.8	.94	26.4	62.1
1958	113.9	.95	25.0	62.4
1959	122.2	.94	24.2	61.6
1960	128.1	.97	23.1	64.0
1961	129.6	1.01	22.7	64.6
1962	135.6	1.01	22.5	64.9
1963	141.2	1.00	21.5	65.0
1964	149.6	.98	21.1	66.4
1965	157.3	.98	20.5	67.9
1966	167.4	.98	19.7	67.8
1967	177.0	.98	19.8	68.1
1968	185.7	1.01	19.2	68.5
1969	194.1	1.05	19.4	68.2
1970	200.1	1.08	18.4	67.6
1971	216.8	1.09	17.7	67.7
1972	233.5	1.05	17.7	67.4
1973	262.2	.96	17.2	67.2
1974	324.8	.80	17.2	68.3
1975	367.4	.76	17.3	71.3

N/A = Not available.

[1] Includes Alaska and Hawaii beginning with 1960. [2] Unpublished data from the farm real estate tax series (*6*).

Sources: (*6, 12, 62, 64*).

as a percentage of farm real estate values (land and buildings) decreased from 29.7 percent in 1932 to 17.3 percent in 1975 (table 10). The decline has been steady since the high of 32.4 percent accounted for by buildings was reached in 1936. Thus, evidence suggests that the farm real estate tax has been becoming increasingly a land tax.

The situation regarding the value of farm real estate as a percentage of all farm assets has been much more stable. USDA figures show that the value of farm real estate (land and buildings) was 63.5 percent of the value of all farm assets in 1940 (table 10).[37] The figure was 71.3 percent in 1975 and the intervening years show only mild fluctuation. This finding is corroborated by the classic work of Tostlebe (*51*). He found that the value of farmland and buildings was 78.1 percent of the value of all farm physical assets (land and buildings, implements and machinery, livestock, and crop inventories) in 1870 and 70.1 percent in 1950 (*51*, p. 36). The percentage was not above 81.5 (1925) in the interim. One must thus conclude that land and buildings have formed a stable basis for farm taxation for a long time and that recent years have seen little change in this situation.

Real Estate as an Input

Real estate accounted for 83.1 percent of all farm property taxes paid during the 1927-75 period. Because land forms such an important part of the farm property tax base, it is important to examine whether it has been declining in relative importance as an input in the agricultural sector. Any such decline would mean that the rationale of farm taxation on the basis of real estate was eroding. Some would go so far as to urge the abandonment of any tax base incapable of keeping pace with technological change. Such a decline could help explain any deterioration of property taxation revenues not only internally to the agricultural sector but externally as well. It might partially explain the decline in the share of the total U.S. property tax contribution accounted for by the farm sector, as was shown in table 1.

But land as a basis for taxation has not deteriorated. Indeed, it has been quite responsive to inflationary pressures and farmland has attracted a class of non-farm investor buyers that view their land at least in part as a consumption good or tax shelter. Land accounted for 18 percent of the inputs used in agricultural production in 1975 (table 11). It also was 18 percent of total inputs in 1870 and has not deviated much from this over the years. One must, therefore, look to other reasons to explain the changing role of the farm real estate tax in the tax systems.

Another way to examine real estate as an input is to view it as a production expense. Farm real estate taxes were 4.4 percent of total production

[37] Farm assets include real estate, livestock, machinery and motor vehicles, crops stored on and off farms, household equipment and furnishings, deposits and currency, U.S. savings bonds, and investments in cooperatives (*62*).

Table 11—Farm inputs: Percentage distribution of subgroup indexes

Year	Labor	Real estate[1]	Power and machinery	Agricultural chemicals[2]	Feed, seed and livestock purchases[3]	Taxes and interest	Miscellaneous	Total
				Percent				
1870	65	18	3	0	3		11	100
1880	62	19	4	0	3		12	100
1890	60	18	5	1	3		13	100
1900	57	19	7	1	3		13	100
1910	53	20	9	2	3		13	100
1915	52	20	10	1	2		15	100
1920	50	18	12	2	4		14	100
1925	49	18	12	2	4		15	100
1930	46	18	14	3	4		15	100
1935	47	19	13	2	4		15	100
1940	53	20	11	2	5	6	3	100
1945	48	18	15	2	7	7	3	100
1950	38	20	21	3	8	7	3	100
1955	32	19	24	5	9	8	3	100
1960	26	19	25	6	11	9	4	100
1965	21	20	25	9	12	9	4	100
1970	16	18	25	13	14	10	4	100
1974	15	18	26	15	14	9	3	100
1975	15	18	27	15	13	9	3	100

[1] Land in government programs is included in the real estate input group although much of this land contributed little to agricultural production. [2] Includes fertilizer, lime, and pesticides. [3] Nonfarm portion of feed, seed, and livestock purchases.

Sources: (*8, 67*, plus supplemental ERS data).

expenses for the 1913-75 period (table 12).[38] Throughout the period taxes as a percentage of production expenses have been quite stable, except for periods of decreased demand for farm products and lower farm prices. Taxes rose to a high of 10.3 percent of production expenses in 1932 during the Great Depression, but most of the time they have been less than 5 percent. So, one must conclude that farm real estate as an input item has been quite stable and does little to explain the decline in farm real taxes as a share of all property taxes observed through time (table 1).

Farm Income

One way of measuring the burden of farm taxes is compare them with gross farm income. This income concept includes cash receipts from farm marketings, government payments to farmers, nonmoney income from farm products consumed (including housing), and other farm income (from recreation, etc.) (*63*). Taxes, when compared against this value, can be regarded as a business production expense.

Farm real estate taxes as a percentage of realized gross farm income stood at 2.6 percent in 1913 and 2.9 percent in 1975 (table 12). It reached a high of 7.2 percent during the Great Depression (1932) and a low of 1.7 percent during World War II (1944), but for the long run this cost item for farmers has been remarkably stable.

The pattern for all farm property taxes is somewhat similar. The inclusion of personal property does induce a longrun downward trend due to the declining importance of these taxes (table 12). The farm property tax bill (real and personal) was 4.6 percent of realized gross farm income in 1927 and 3.4 percent in 1975. As with the real property portion, the high came in 1932 (8.0 percent) and the low in 1944 (2.0 percent). Still, the longrun stability has been quite impressive.

A commonly accepted means of evaluating tax burdens of citizens is to express taxes as a proportion of personal income. Under this view, the property tax is regarded largely as a tax levied on all property owners to finance local government services. Personal income is especially relevant since all taxes must ultimately be paid from household income.

Farm personal income also is an important concept since it includes income from both farm and nonfarm sources. The inclusion of income from nonfarm sources is a new consideration since it is not included in the national income accounts in determining NIF (discussed above in connection with table 1) nor is it included in realized gross farm income. Total personal income of the farm population grew from $5.37 billion in 1934 to $45.46 billion in 1975 (table 12).

[38] Farm production expenses include current farm operating expenses: wages paid to hired labor (cash and in-kind); outlays for repair of equipment and operation of farm; purchases of feed, seed and livestock; overhead costs such as depreciation and other capital consumption; taxes on farm property; and interest on farm mortgage debt (*63*).

Table 12—Farm property taxes as a percentage of farm production expenses, and as a percentage of gross farm income and personal income of the farm population, United States, selected years, 1902-75[1]

Year	Farm real estate taxes/ Farm production expenses	Farm real estate taxes/ Gross farm income	Farm property taxes/ Gross farm income	Personal income of farm population, all sources	Farm property taxes/ Personal income of the farm population[2]	Farm population: Personal income from nonfarm sources/Personal income from all sources
	Percent	*Percent*	*Percent*	*Billion dollars*	*Percent*	*Percent*
1902	N/A	N/A	N/A	N/A	N/A	N/A
1913	5.2	2.6	N/A	N/A	N/A	N/A
1922	6.9	4.0	N/A	N/A	N/A	N/A
1927	7.2	4.0	4.6	N/A	N/A	N/A
1932	10.3	7.2	8.0	N/A	N/A	N/A
1934	8.1	4.5	4.9	5.37	7.0	40.7
1936	7.0	3.7	4.1	7.23	5.5	36.5
1938	6.8	3.9	4.4	7.18	5.6	34.5
1940	5.8	3.6	4.1	7.60	5.3	36.3
1942	4.0	2.1	2.5	14.09	3.0	28.0
1944	3.4	1.7	2.0	16.64	2.7	26.7
1945	3.6	1.8	2.2	17.21	3.0	25.6
1946	3.6	1.8	2.1	20.03	2.8	22.7
1947	3.6	1.8	2.1	21.13	3.1	25.1
1948	3.5	1.9	2.3	23.79	3.1	24.4
1949	3.9	2.2	2.8	19.48	4.1	31.8

See footnotes at end of table

—Continued

Table 12—Farm property taxes as a percentage of farm production expenses, and as a percentage of gross farm income and personal income of the farm population, United States, selected years, 1902-75[1] —Continued

Year	Farm real estate taxes/ Farm production expenses	Farm real estate taxes/ Gross farm income	Farm property taxes/ Gross farm income	Personal income of farm population, all sources	Farm property taxes/ Personal income of the farm population[2]	Farm population: Personal income from nonfarm sources/Personal income from all sources
	Percent	*Percent*	*Percent*	*Billion dollars*	*Percent*	*Percent*
1950	3.8	2.3	2.8	20.35	4.1	30.8
1951	3.5	2.1	2.7	22.66	3.9	28.7
1952	3.6	2.2	2.8	22.00	4.2	30.6
1953	3.9	2.4	3.0	19.70	4.9	32.7
1954	4.0	2.6	3.2	18.34	5.3	32.4
1955	4.2	2.8	3.5	17.45	5.9	35.5
1956	4.3	2.8	3.5	17.65	6.0	37.3
1957	4.4	3.0	3.7	17.46	6.4	37.9
1958	4.2	2.8	3.5	19.21	6.1	34.8
1959	4.2	3.0	3.8	17.53	7.1	40.6
1960	4.5	3.2	4.0	18.36	7.3	39.4
1961	4.6	3.3	4.0	19.05	7.3	40.1
1962	4.5	3.3	4.0	19.74	7.3	42.3
1963	4.5	3.3	4.1	19.97	7.4	44.9
1964	4.6	3.4	4.2	19.76	7.7	49.3
1965	4.6	3.4	4.1	22.60	7.1	47.0
1966	4.5	3.2	4.0	23.81	7.2	47.1
1967	4.5	3.5	4.2	22.85	7.9	51.4

See footnotes at end of table.

—Continued

Table 12—Farm property taxes as a percentage of farm production expenses, and as a percentage of gross farm income and personal income of the farm population, United States, selected years, 1902-75[1] —Continued

Year	Farm real estate taxes/ Farm production expenses	Farm real estate taxes/ Gross farm income	Farm property taxes/ Gross farm income	Personal income of farm population, all sources	Farm property taxes/ Personal income of the farm population[2]	Farm population: Personal income from nonfarm sources/Personal income from all sources
	Percent	*Percent*	*Percent*	*Billion dollars*	*Percent*	*Percent*
1968	4.8	3.6	4.4	24.10	8.0	53.2
1969	4.8	3.6	4.3	26.86	7.7	51.9
1970	4.9	3.7	4.4	27.38	8.0	52.6
1971	5.0	3.9	4.6	28.71	8.3	53.2
1972	4.7	3.5	4.1	34.41	7.1	51.3
1973	3.8	2.6	3.1	48.58	5.1	40.2
1974	3.7	2.6	3.1	45.08	5.8	47.8
1975	3.8	2.9	3.4	45.46	6.2	50.0

N/A = Not available.

[1] Includes Alaska and Hawaii beginning with 1960. [2] Total personal income before deduction of farm property taxes. Includes net rent paid to non-operator landlords.

Sources: (*6, 48, 63*).

Farm property taxes as a percentage of the personal income of the farm population were 7.0 percent in 1934 and 6.2 percent in 1975 (table 12). They ranged from a low of 2.7 percent (1944) to a high of 8.3 percent (1971). Moreover, they have shown somewhat more instability through time than have farm property taxes as a percentage of gross farm income. Thus, from the viewpoint of the household, farm property taxes are somewhat more unpredictable than they were when regarded as a farm business expense.

The nonfarm portion of farm personal income has been substantial for a long time and its importance has been growing until recent years. Personal income of the farm population from nonfarm sources stood at 40.7 percent of all farm personal income in 1934 (table 12). It declined to 22.7 percent in 1946, but it has been as high as 53.2 percent (1968, 1971) since. It stood at 50.0 percent in 1975. This reflects the growing importance of off-farm employment at least until recently. According to the Census of Agriculture, the percentage of all farm operators working 100 days or more off their farms increased from 11.5 percent in 1929 to 39.9 percent in 1969. It was only 29.9 percent as late at 1959 showing the importance of the spurt in such employment at least during the early 1960's (*53*). However, more recent evidence has cast some doubt on whether the growth in nonfarm employment by the farm population has continued since the mid-1960's (*71*).

In order to keep proper perspective one must be careful not to overrate the significance of the nonfarm earnings included in farm personal income as a one-way source of funds for the payment of farm property taxes. The nonagricultural sector has made significant investments in the agricultural sector, and pays taxes and experiences losses of income while operating in this sector. Indeed, the use of farm income loss to offset nonfarm income has attracted a number of farm investments by relatively higher income nonfarm people in recent years. The spread of such "tax loss" farming has tended to further complicate an already quite complex relationship between the agricultural and nonagricultural sectors as far as personal income is concerned (*11*).

IMPLICATIONS

The evidence shows that the agricultural sector historically has paid a disproportionate share of its portion of national income to property taxes. During the 1932-75 period, farm property taxes accounted for 8.0 percent of all property taxes, but the national income originating in farming was 4.0 percent of total national income. Viewed another way, during this span property taxes took 7.9 percent of national income originating in farming and only 4.0 percent of the national income originating in the nonfarm sector. Farm incomes have typically been lower than those in the nonfarm sector, but the evidence is inconclusive whether much of the higher property tax bill for farmers can be blamed on the regressivity of the tax. The relative capital intensity of the agricultural sector is probably the primary cause of its higher property tax payments.

The traditional view of property tax incidence was that landowners bore the tax on land, but that the tax on buildings, improvements, and businesses was borne mostly by consumers, in proportion to their consumption patterns. The property tax (excluding the portion on land site value) was regarded as an excise tax and was thought to be regressive because increases in income do not lead to proportionate increases in consumption. Moreover, historically the view has been that the impact of the property tax on the agricultural sector has been quite regressive.

The revised incidence theory says that the property tax leads to a lower overall rate of return on investment with the tax ultimately being borne by the owners of capital. Under the revised theory, funds move to lower tax industries where the rate of return is higher, until the longrun rate of return in all sectors becomes the same.

The implications are that, under the new theory with owners of capital bearing much of the burden, a property tax is less regressive for agriculture than under the old partial equilibrium model. Thus, horizontal equity vis-a-vis the rest of the world may be somewhat better than under the traditional view.

Agriculture's historical lack of market power and greater capital intensity heighten the a priori potential significance of the new theoretical approach for the sector to some degree over the nonagricultural sector—especially in terms of reduced regressivity. But how the agricultural sector fares in a comparative sense with the nonagricultural sector depends upon the relative distribution of capital ownership between the sectors by income level. Evidence suggests that there is a much higher ratio of wealth to income in the agricultural sector. Moreover, internal agricultural-sector wealth is skewed much more toward the lower end of the income scale than is true for the economy as a whole. These factors tend to negate a substantial part of the potential progressivity of the property tax for this sector under the new theoretical view. It follows that under the new approach the agricultural sector could still end up paying more than its share of the tax, due to comparatively more wealth at the lower income levels. More evidence on the income-wealth relationships is needed, but it appears that the agricultural sector faces a horizontal inequity concerning the property tax no matter which set of assumptions is used.

But the property tax also may be viewed as a wealth tax and this leads to other conclusions. When horizontal equity between sectors is measured by the ratio of taxes to wealth, it becomes evident in terms of this measure that the agricultural sector traditionally has paid proportionately less property tax than has the nonagricultural sector. Available data show that this conclusion holds for the entire post-1935 time period. In 1935, the ratio of property taxes to wealth was .010 (1.0 percent) for the agricultural sector and .015 (1.5 percent) for the nonagricultural sector. In 1974, the ratios were .006 and .014, respectively. Throughout the 30-year span, the range of difference in favor of the agricultural sector has varied from .002 to .007. (The range was not significantly altered when the nonprofit sector was subtracted from the nonagricultural sector.) The above conclusions must be tempered somewhat because the

evidence suggests that property taxes are largely capitalized into farm property values, which depresses the farm values and distorts comparisons with other sectors to some degree.

Nevertheless, as interesting as the tax-wealth data are, they do not represent a final answer to the question of relative tax burden between sectors. Taxes typically are paid from current income so the concern about the relative tax/income ratios tends to dominate that for the relative tax/wealth ratios—and the concern for the agricultural sector's comparative "burden" continues.

Various attempts have been taken to help the agricultural sector with its property tax burden. These include laws: (1) giving preferential or use-value assessment for farmland, (2) granting the exemption of major classes of farm personal property from taxation, and (3) establishing some homestead and circuit-breaker tax relief plans. There are pros and cons to this growing movement to provide relief by making such changes and thus eroding the tax base. Farm use-value assessment is no exception (*2*, pp. 85-86). The homestead and circuit-breaker approach does not favor farmers in many instances. However, the exemption of personal property tends to give farmers a significant boost because of their typically substantial investment in livestock and machinery.

Viewed abstractly it would seem that further reform is required to make the property tax more equitable for agriculture. But it must be kept in mind that any movement to nonproperty taxes by higher levels of government, and concomitant increased intergovernmental revenues flowing down to lower governmental levels, could cause local citizens to lose some degree of control over their local institutions. Despite criticism on a number of grounds, the property tax has afforded a considerable degree of local flexibility and control in rural areas.

Property tax incidence should not be viewed alone, but rather as part of a national tax system—Federal, State, and local. For example, local property taxes are a deductible item on Federal income taxes. Though the property tax may appear to be burdensome, it may lower the Federal income tax bill of the high-income taxpayer significantly. Interestingly, Pechman and Okner found that the U.S. tax system is virtually proportional with respect to income for the vast majority of families regardless of the incidence assumptions of their model (*45*, p. 64).

The longrun revenue stability of the property tax in the agricultural sector largely is due to the stability of real estate as an input and to increases in the value of farmland and buildings that have kept pace with the value of all farm assets. (The share of farmland and building values accounted for by buildings has declined through time, however.) The basic historical factors that have been influencing the farm property tax do not appear likely to change significantly in the near future. Thus, the longrun horizontal inequity of the property tax borne by the agricultural sector, when measured in terms of tax/income ratios, is likely to continue.

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